MARINE REVIEW

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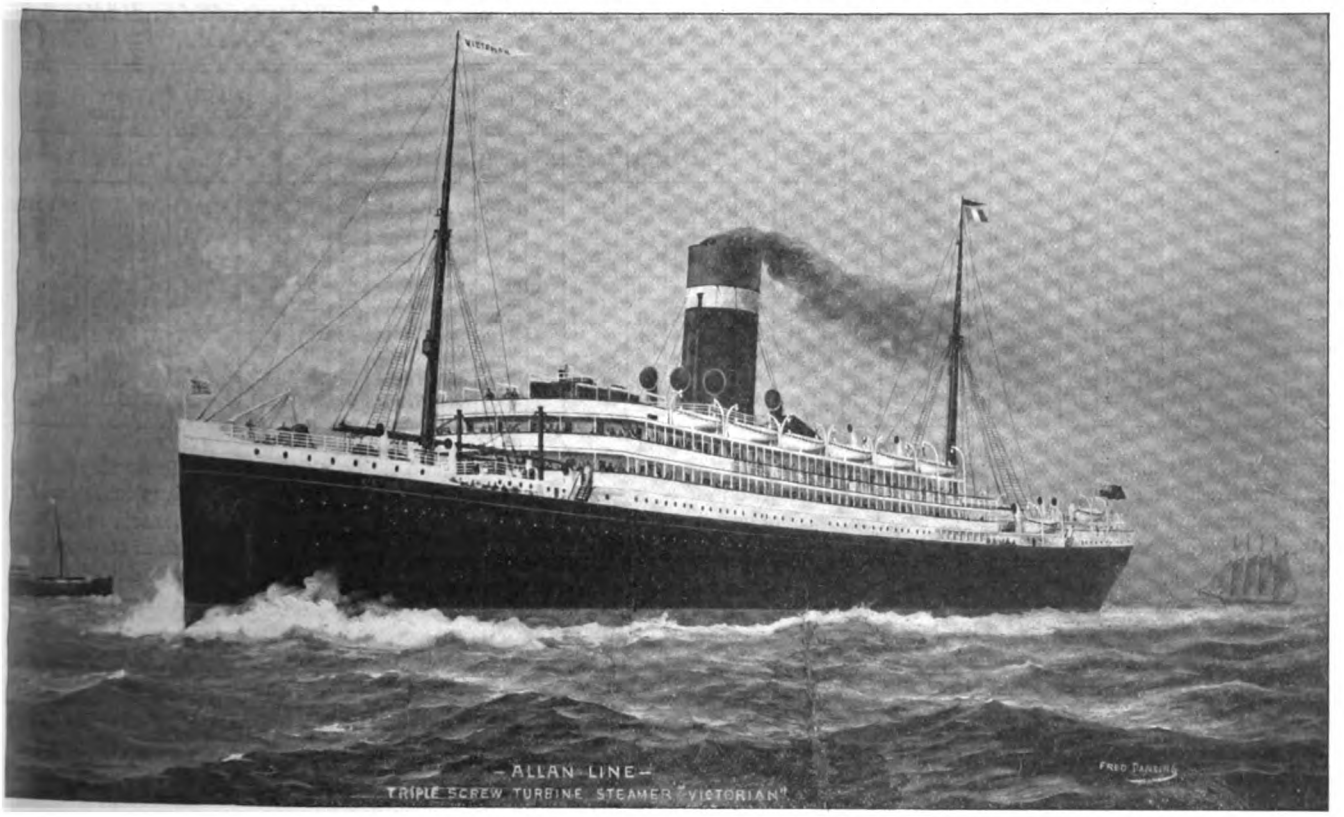
BIDS FOR SCOUT CRUISERS SOLICITED

Bids will be opened by the navy department at noon April 15 for the construction of three scout cruisers of 3,750 tons trial displacement to cost, exclusive of armament, $1,800,000 each. These vessels will be known as the Chester, Birmingham and Salem. Their general dimensions are: Length between perpendiculars, 420 ft.; beam, molded, 46 ft. 8 in.; displacement at mean draught, 16 ft. 9½ in.; coal bunker capacity, 1,250 tons. For over a year or more it has been reported that the intention of the navy department was to equip two of these scouts with turbine engines of different makes, presumably the Curtis and Parsons, while the third scout was to be fitted with the ordinary reciprocating engine. It appears, however, that the navy department was unable to obtain from the builders of turbine machinery certain necessary guarantees that accompany the construction of vessels of this character and it is very probable that the scouts will all be equipped with reciprocating engines. However, the navy department has not altogether abandoned the hope that one or more of the scouts will be equipped with turbine engines and that therefore two classes of bids are invited, one upon the navy department's design and the other upon the builder's design of machinery, preference to be given, all things being equal, to a turbine installation. The engines are to develop 16,000 H. P. and are to be supplied with steam from twelve water-tube boilers of the Express type.



ALLAN LINER VICTORIAN, SISTER OF THE VIRGINIAN.

Lindon W. Bates, of New York, is the successful bidder on two contracts for the enlargement of the Erie canal, No. 1 for $605,008 and the other for $726,815.

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WORLD'S SHIP BUILDING DURING 1904

Lloyd's statistical summary of ship building throughout the world is now at hand. In explanation of the figures it is to be said that the summary includes particulars of vessels of 100 tons gross and upwards and takes into account only vessels that were launched in 1904, whether they were completed during the year or are still under construction. During 1904, exclusive of war ships, 712 vessels of 1,205,162 tons gross (viz., 613 steamers of 1,171,375 tons and 99 sailing vessels of 33,787 tons) were launched in the United Kingdom. The war ships launched at both government and private yards amount to thirty-seven of 127,175 tons displacement. The total output of the United Kingdom for the year has, therefore, been 749 vessels of 1,332,37 tons. In these notes, war ships are excluded from consideration except where they are specially mentioned.

The output of mercantile tonnage in the United Kingdom during 1904 shows the slight increase of about 15,000 tons on that of last year, and, with the exception of 1903, is the lowest since 1897. Compared with the returns for 1901, when the output of both mercantile and war tonnage reached the highest level, the present figures show a reduction of 320,000 tons as regards merchant vessels, and 84,794 tons as regards war vessels. It may be mentioned that 99.71 per cent of the tonnage launched has been built of steel, .17 per cent of iron and .12 per cent of wood, and that 97.2 per cent is composed of steam tonnage.

Of the total output, 962,679 steam tons and 17,314 sailing vessels of 48,858 tons (4 per cent of the total output). Next comes Austria-Hungary and the British colonies with 35,561 tons and 33,542 tons, respectively. Germany follows with 23,651 tons, and then Sweden with 17,017 tons.

The annual ship building statistics of Lloyd's Register during recent years have illustrated the tendency towards the construction of steamers of large tonnage. During the four years, 1892-5, on an average eight vessels of 6,000 tons and upwards were launched per annum in the United Kingdom; in the following four years, 1896-9, the average rose to twenty-five, and to thirty-nine for the four years 1900-3. Of vessels of 10,000 tons and upwards, only three were launched in the four years 1892-5; seventeen were launched during the four years 1896-9; and thirty-two were launched during the four years 1900-3. In 1904, however, the number of vessels launched of 6,000 tons and upwards was only fifteen, three of which were of over 10,000 tons; but it may be mentioned that there are under construction at the present time twenty-five vessels of 6,000 tons and upwards, of which eight are of over 15,000 tons each. The largest steamers which have been launched during 1904 are the following:

	Gross tons.		Gross tons.
Virginian	11,000	Caronia	20,000
Caledonia	9,250	Victorian	11,000

Of the principal ship building centers of the country, Glasgow takes the lead, showing an output of 238,725 tons. Then follow in order Newcastle, 236,055 tons; Sunderland, 229,135 tons; Greenock, 146,838 tons; Middlesbro', 110,236 tons; Hartle-

Table showing the number and tonnage of vessels of 100 tons gross and upwards (excluding warships) launched in the world during the years 1892-1904.

Year.	United Kingdom.		Austria-Hungary.		British Colonies.		Denmark.		France.		Germany.		Holland.		Italy.		Japan.		Norway.		United States.		Other Countries.		Totals.	
	No.	Tons.	No.	Tons.	No.	Tons.	No	Tons.	No.	Tons	No	Tons.	No.	Tons.	No	Tons	No.	Tons.	No.	Tons	No.	Tons.	No.	Tons	No	Tons
1892	681	1,109,950	7	2,202	58	19,792	22	12,707	19	17,228	73	64,888	15	14,368	21	13,888	..	....	42	24,572	73	62,588	40	15,762	1,051	1,358,045
1893	536	836,383	6	7,435	41	17,089	18	10,719	22	20,337	65	60,167	8	1,339	21	10,626	3	1,132	30	16,552	86	27,174	60	17,788	846	1,025,740
1894	614	1,046,508	5	1,703	27	6,803	16	7,300	28	19,636	77	119,702	41	15,360	10	5,896	14	3,173	25	17,169	43	66,894	32	13,894	932	1,323,585
1895	579	950,967	10	7,371	30	10,381	14	10,982	27	28,851	75	87,786	25	8,292	10	5,603	3	2,206	21	12,873	61	84,877	25	7,881	880	1,218,180
1896	696	1,159,751	9	6,246	41	11,124	14	11,814	41	44,565	63	103,295	28	12,405	10	6,779	26	7,849	17	12,059	144	184,175	24	7,820	1,113	1,567,278
1897	591	952,486	6	6,601	40	12,431	13	18,539	39	49,341	84	139,728	42	20,351	8	12,910	22	6,740	25	17,248	84	86,838	36	13,711	990	1,326,924
1898	761	1,367,570	9	5,482	70	25,021	17	12,703	48	67,160	104	153,147	27	19,468	19	26,530	9	11,424	29	22,670	162	173,250	35	8,968	1,200	1,896,343
1899	728	1,416,791	8	9,248	34	8,464	30	26,613	51	89,794	93	211,684	50	34,384	31	49,472	8	6,775	34	27,853	148	224,278	61	16,382	1,309	2,121,779
1900	692	1,442,471	12	14,889	40	9,563	17	11,060	66	116,858	93	204,731	61	45,074	36	67,522	8	4,543	42	32,751	235	333,527	67	21,174	1,364	2,504,162
1901	639	1,524,739	7	20,013	74	28,134	41	22,856	92	177,543	101	217,593	33	29,927	35	60,526	94	37,208	40	36,875	286	433,235	96	28,800	1,538	2,617,569
1902	694	1,427,558	16	15,192	69	28,819	44	27,148	99	192,196	108	213,961	114	69,101	62	46,270	53	27,181	46	37,878	251	379,174	94	38,277	1,650	2,562,775
1903	697	1,190,618	6	11,328	73	34,690	39	28,609	75	92,768	120	184,494	109	59,174	81	50,089	62	34,514	54	41,599	246	381,820	88	35,928	1,650	2,145,681
1904	712	1,205,162	40	16,645	61	30,965	30	15,859	69	81,245	149	202,197	109	55,636	35	30,016	67	32,969	67	50,469	227	238,518	77	28,254	1,643	1,967,555

tons, or 979,993 tons in all (81¼ per cent) have been built for registration in the United Kingdom. In this connection, it should be noted that the losses, etc., of United Kingdom vessels during twelve months are shown by Lloyd's Register wreck returns to average 259,000 tons (208,000 steam, 51,000 sail). Sales to foreign and colonial owners for the twelve months ended November, 1904, reached a total of 361,000 tons (312,000 steam, 49,000 sail). On the other hand, 5,500 tons (4,200 steam, 1,300 sail) were built abroad for United Kingdom owners, and purchases from foreign and colonial owners during the same period amounted to 63,000 tons (57,800 steam, 5,200 sail). The sailing tonnage of the United Kingdom would thus appear to have decreased by about 76,000 tons, while the steam tonnage has increased by 505,000 tons. The net increase of United Kingdom tonnage during 1904 is therefore about 429,000 tons. For the last five years the estimated net increases were as follow: 1899, 313,000 tons; 1900, 220,000 tons; 1901, 543,000 tons; 1902, 643,000 tons; 1903, 405,000 tons.

In 1904, 18¾ per cent of the total output has been acquired by foreign and colonial shipowners, as compared with 18 per cent in 1903 and 1902, 23 per cent in both 1901 and 1900, 19 per cent in 1899, 22 per cent in 1898, and 25 per cent in 1897. Norway has provided in 1904 the largest amount of work for the ship builders of the United Kingdom, viz.: seventeen pool, 96,154 tons, and Belfast, 74,251 tons. In warship tonnage the leading ports stand thus: Glasgow, 16,730 tons; London, 16,705 tons; Newcastle, 12,120 tons, and Greenock, 10,850 tons.

During 1904 thirteen vessels fitted with steam turbines have been launched in the United Kingdom. It will doubtless be of interest to record the names of these vessels. They are as follows:

	Gross tons.		Gross tons.
Victorian	11,000	Loongana	2,448
Virginian	11,000	Lama	2,171
Channel steamers—		Lhasa	2,171
Manxman	2,174	Linga	2,171
Londonderry	2,086	Lunka	2,171
Princess Maud	1,746	Turbinia	1,664
Yachts—			
Albion	1,000	Narcissus	600

In addition to the above vessels there are at the present time under construction in the United Kingdom, besides the two large express steamers for the Cunard company, five vessels of about 29,500 tons which are to be fitted with steam turbines.

The returns for the year under review include ninety-one steam trawlers and other fishing vessels; sixty-four dredgers, barges, etc.; twenty-five tugs, twenty yachts, fourteen vessels

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of the turret-deck type, and other vessels designed for special service. Besides these, over fifty vessels, varying in tonnage from 100 tons to 1,300 tons, and principally intended for river and harbor purposes, have been built in the United Kingdom and taken to pieces for shipment abroad. Of the vessels launched in the United Kingdom, 521 of 961,094 tons have been built under the society's inspection with a view to classification in Lloyd's register book.

As regards the movements of the ship building industry during the course of 1904, Lloyd's Register returns show that, at the opening of the year, irrespective of war ships, 898,478 tons (875,320 steam, 23,158 sail), were being built in the United Kingdom. The returns for the March quarter indicated an increase of 90,000 tons in the work in hand; the June and September figures were better still, and at the present time the work in progress (viz.: 1,049,860 tons) is more by 151,000 tons, or nearly 17 per cent, than it was twelve months ago. As compared with the work in hand in September, 1901, when the highest figures recorded in the history of the ship building industry were reached, the tonnage now under construction is less by 364,000 tons, or 25¾ per cent. As regards the amount of warship tonnage under construction in the country the highest total recorded by Lloyd's Register was reached in March, 1900, when 454,000 tons displacement were in hand. The total is now 282,810 tons.

Other countries built during the year 570 steamers of 626,190 tons and 361 sailing vessels of 156,583 tons, in addition to sixty-five war vessels of 307,831 tons displacement. These figures show the large reduction of 172,000 tons as regards merchant vessels as compared with those for 1903. This reduction affects the output of most countries, Germany being the only one showing an increase for the year of over 10,000 tons. Among foreign countries, the three leading places are held by the United States of America (239,000 tons), Germany (202,000 tons), and France (81,000 tons).

The total mercantile tonnage reported from the United States shows a decrease of no less than 143,000 tons on that of the previous year, this reduction accounting for over 83 per cent of the total decrease in the colonial and foreign output for 1904. The outstanding feature in the output for the United States is the enormous decrease which has taken place in the tonnage built for service on the great lakes, which from an average of 163,000 tons for the years 1901-3, has fallen to 40,000 tons in 1904. This year, however, has seen the launch of the Augustus B. Wolvin, of 6,585 tons, the largest steamer built on the great lakes up to the present.

It may be mentioned that six wood sailing vessels of between 2,000 and 3,000 tons and three of above 3,000 tons were launched in the United States during 1904, the largest of which is the five-masted schooner Jane Palmer, of 3,138 tons. There were but three seagoing steamers of between 4,000 and 6,000 tons launched during the year; the only one beyond this tonnage being the Dakota, of 20,718 tons gross.

As regards, however, the warship tonnage launched in the United States during 1904, which amounts to about 171,000 tons displacement, it may be stated that, with one exception, this is the highest total ever launched for any country during one year; the exception being the year 1901, when 210,000 tons of British war vessels were launched in the United Kingdom.

Germany has launched two steamers exceeding 8,000 tons, viz.: the Prinz Eitel Friedrich of 8,865 tons, built at Stettin, and the Scharnhorst of 8,131 tons, built at Geestemünde, also fifteen steamers of between 4,000 and 7,000 tons. No important sailing vessel is included in the output of Germany during the year. As mentioned above, Germany is one of the foreign countries whose output for the year shows an increase, which, however, only amounts to about 2,000 tons if both merchant and war vessels are taken into account.

The most significant feature in respect of the ship building industry in France, as reported in the society's statement for 1903, was the abandonment of the construction of large steel sailing vessels. Neither in that year nor in 1904 was one such vessel launched, and none are under construction at the present time. The steam tonnage launched in France during 1904 amounts to about 74,000 tons, and includes ten vessels of 5,000 tons and above, the largest being the El Kantara and the Louqsor, of about 7,290 tons each, launched at La Ciotat.

The total tonnage (55,636 tons) launched in Holland during the past year does not include vessels known to be exclusively intended for river navigation. From returns received from that country it appears that the tonnage of barges, lighters and other river vessels launched during 1904 amounts to nearly 50,000 tons.

The total output of the world during 1904 (exclusive of war ships) appears to have been 1,987,935 tons (1,797,565 steam, 190,370 sail). Lloyd's Register wreck returns show that the tonnage of all nationalities totally lost, broken up, etc., in the course of twelve months amounts to about 721,000 tons (422,000 steam, 299,000 sail). The net increase of the world's mercantile tonnage during 1904 is thus about 1,267,000 tons. Sailing tonnage has been reduced by 109,000 tons, while steam tonnage has increased by 1,376,000 tons.

Compared with the net increase for the world, the net increase of 429,000 tons, as stated above, for the United Kingdom is equivalent to nearly 34 per cent. In the net increase of the world's steam tonnage, viz., 1,376,000 tons, the United Kingdom has shared to the extent of 505,000 tons, or 36⅔ per cent. Of the tonnage launched during 1904, the United Kingdom has acquired over 49½ per cent; and of the new steam tonnage the United Kingdom has acquired over 53¾ per cent.

A new table has been included in the present summary which gives the number and tonnage of merchant and other vessels launched in the United Kingdom and abroad in each of the last thirteen years. This table will no doubt be found of use as showing the state of the world's ship building industry during recent years. It is incorporated in this article.

SHORTAGE OF ENGINEERS IN THE NAVY

Rear Admiral Charles W. Rae, engineer-in-chief of the navy department, points to a rather serious condition of affairs in his annual report. He practically admits that the supply of engineers is so inadequate that it is impossible to keep ships in commission and at the same time find enough men who are competent to take charge of the shore establishments. The personnel bill is practically admitted to be a failure. The engine room is not in favor. While it is essential that at least 10 per cent of the officers should perform engineering duties exclusively, not 5 per cent are available. Engineers are lacking for nearly every ship already afloat to say nothing of those that are now building. The experiment of relying upon volunteers for the engine room appears to have been a complete failure. While Admiral Rae does not say so in so many words, he nevertheless recommends compulsory service in this department. It will scarcely be credited. But it is none the less true that the number of engineer officers borne for service on the books is only sixty-six, consisting of eight captains, fourteen commanders and forty-four lieutenant commanders. There are now no officers below this rank borne for engineering duty only. The engineering departments of the majority of the vessels of the United States navy exclusive of the heavier vessels are in charge of young line officers or of warrant machinists. It is probably practical in time of peace to get along with this small engineering staff but in time of war a large and efficient staff is absolutely essential to the proper management of a ship. As to the verity of this the Russian navy has proved an illustration of sufficient magnitude.

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MOVEMENT OF TRAINS BY TELEPHONE

The Baltimore & Ohio railroad has gained the distinction in its progressive policy of being the first steam railroad in the world to reduce the movement of trains by telephone to a systematized practice, clothed with the best safeguards, as has been the telegraph train handling system that has been in operation for many years. The use of the telephone in this connection, having been demonstrated to be effective, the management of the road has authorized its officials to avail themselves of this valuable auxiliary from time to time as experience proves it to be desirable, economical and in any way tend to safely hasten the movement of trains.

A conference of the dispatching forces was held recently at Baltimore, and a set of rules and forms was arranged so as to reduce the method of handling trains by telephone to a standardized system. Mr. Chas. Seldon, superintendent of telegraph, was chairman of the conference, and it is the expectation that every non-telegraph station that has a passing siding will be fitted up with a telephone connection to the nearest telegraph office. This will enable the transmission of train orders from the telegraph office to the train crews at such sidings direct, or to an employe stationed there for that purpose.

For some time the Baltimore & Ohio railroad has been extending the use of the telephone for the transmission of ordinary business messages, connecting the division headquarters with the terminals of the divisions by means of the "composite" telephone method. This system admits of the simultaneous working of the wires telephonically and telegraphically without interfering with each other. Such circuits have been established between Chicago and Garrett, Ind.; between Garrett and Chicago Junction, O.; thus connecting up the Chicago division; between Newark and Chicago Junction; between Newark and Wheeling; between Wheeling and Fairmount; between Grafton and Wheeling; between Pittsburg and Wheeling and between Wheeling and Holloway, thus connecting the general superintendent of this grand division with the various superintendents and terminals with which he deals. Other circuits have been established from Grafton to Clarksburg; Clarksburg to Parkersburg and from Grafton to Cumberland, thus completing the circuits for the division located at Grafton. There are also circuits between Baltimore and Brunswick, Md., and Baltimore and Philadelphia for a like purpose.

In addition to these long circuits the telephone is used extensively in single track blocking and for the movement of yard engines and the connection of non-telegraph stations with telegraph stations by which trains are moved from the former to the latter where the ordinary telegraph orders are received. In this manner the telephone is used for single track blocking between Newark and Bellaire, O. The telegraph offices average about eight miles apart and at many points the siding extends beyond the telegraph office a distance of about two miles. By having the telephone located at the switches, a train is allowed to use the passing siding up to the outlet switch. Then as soon as the train for which it has been held has passed, the conductor notifies the operator in the block signal tower and he is given permission to proceed with his train to the next block signal office. In this the blocks are practically cut down so far as main track use is concerned, just so much as the side tracks extend into the blocks. In some instances, it permits the use of four miles of passing tracks, leaving but four miles of main track to be covered by the blocking. The result is that it practically shortens the block by one-half the distance and hastens the movement of traffic to that extent.

This method of using the telephone between Newark and Bellaire, over 104 miles of single track, has been in use for about two and a half years with great success. It is a system that very much facilitates the handling of traffic and is perfectly safe in the movement of trains.

The Baltimore & Ohio railroad will gradually extend the service to all points on its system where it will be beneficial. It is one of the various improvements being made by the Baltimore & Ohio, that result in thoroughly modernizing the operation of a large railroad system in the interest of the public and the company.

UPBUILDING THE AMERICAN MERCHANT MARINE

At the last meeting of the Newport News Chamber of Commerce the following preamble and resolutions were presented, discussed and, on due motion, unanimously carried:

WHEREAS, The Chamber of Commerce of the city of Newport News have learned through the public press of the report of the congressional commission on the American merchant marine, and have observed with keenest interest the bill recommended for the advancement of the maritime interests of our country; and,

WHEREAS, This chamber is aware of the attachment with which the Hon. Thos. S. Martin, United States senator from this state, has displayed for our ancient system of discriminating duties, and this chamber has shared his views in that respect, but this chamber nevertheless notes with entire approval the fact that Senator Martin's name was not appended to the minority report; and,

WHEREAS, It is the conviction of this body that the previous national policy of inaction has so sapped the marine resources of this country as to abundantly demonstrate the necessity for retaliatory measures; and,

WHEREAS, This chamber perceives that the principle of the proposed subvention is essentially the same as that of discriminating duties; that each form involves national aid from a fund provided by law; that in either case the people are taxed to bestow the benefit; that the difference between the two systems is merely a difference in measures, and not of the thing measured; a difference in the name of the fund derived, but not a difference in the fund; a difference in convenience, not in essence.

NOW THEREFORE BE IT RESOLVED, That the Chamber of Commerce of this city believes that the proposed encouragement to the maritime interests of this country is a measure which will not only advance the commercial interests of this country, but, by reason of intimate relations between sea commerce and national security, will contribute largely to naval effectiveness; that this Chamber of Commerce believes that these considerations place the propositions upon a plane of patriotism, rather than of politics; that entertaining these views, this chamber respectfully urges our senators and representatives in congress to secure the passage of the said measure.

ANNUAL REPORT OF PITTSBURG COAL COMPANY

The annual statement submitted to stockholders by the Pittsburg Coal Co. is the poorest that it has made. The company reports a decrease in profit after deducting all expenses of $3,525,583, in net earnings after allowing for depletion, additions and renewal fund of $3,173,341, and in undivided profits after preferred dividend and interest of $4,150,905. The result of the poor business of the year is probably best reflected in undivided profits, which amount to only $150,941 against $4,310,036 in 1903 and $2,279,441 in 1902. The production in tons in the Pittsburg district was 12,783,067 in 1904 as against 14,034,268 in 1903 and in Hocking district 1,349,428 in 1904 as against 1,480,350 in 1903.

The Allan liner Victorian equipped with turbines is scheduled to sail from Liverpool on March 23 and her sistership Virginian on April 26.

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NATIONAL MOTOR BOAT EXHIBITION

Not alone will everything from this country of interest to sportsmen show at the National Motor Boat and Sportsman's Show, which opens at Madison square garden, New York, on the eve of Washington's birthday, but from foreign countries as well. Applications for space have been received from Pretoria, South Africa, which will send an exhibit of antlers and skulls. E. A. Grunwaldt, executive commissioner from Russia at the St. Louis fair, takes the entire exhibit from that city to the garden show.

Every representative manufacturer of motor boats in America and Europe will show his finest products for 1905. There will be everything in power-driven craft from the diminutive yacht tender, which goes at six miles an hour to the trim autoboats with their ponderous engines that drive them through the water at thirty miles an hour.

Following is a partial list of exhibitors:

H. M. Stevens, Madison square garden, New York; Harry A. Chapman, Bangor House, Bangor, Me.; S. L. Crosby Co., 186 Exchange street, Bangor, Me.; Wm. Roche, 54 Park place, New York; Renny Electric Co., Anderson, Ind.; Chas. E. Miller, 101 Reade street, New York; Lambert Snyder Vibrator Co., 10 W. 22nd street, New York; Victor Metals Co., 29 Broadway, New York; Rudder Pub. Co., 9 Murray street, New York; Dayton Electrical Co., Dayton, Ohio; Chas. F. Spitdorf, 17 Vandewater street, New York; Doubleday, Page & Co., 133 E. 16th street, New York; Tie Co., Unadille, N. Y.; R. J. Dick, 214 Williamson street, Elizabeth, N. J.; Cycle & Automobile Trade Journal, 1213 Filbert street, Philadelphia, Pa.; H. L. Rand, 15 Coburn avenue, Worcester, Mass.; The Lunkenheimer Co., Cincinnati, O.; D. P. Van Gorden, Orange, N. J.; Am. Elec. Novelty & Mfg. Co., Hudson and Vandam streets, New York; Herz & Co., 55 Grand street, New York; Grand Trunk Railway Co., Detroit, Mich.; Canadian Pacific Ry. Co., Montreal, Canada; Richelieu & Ontario Nav. Co., 228 St. Paul street, Montreal, Canada; Intercolonial Ry. of Canada, Montreal, Quebec; Fishery Commission of N. B., Chatham, N. B.; Chas. R. Durkee & Co., 2 and 5 South street, New York; Abercrombie & Fitch Co., 314 Broadway, New York; Wm. Hjorth & Co., Jamestown, N. Y.; Douglas Mfg. Co., 96 Church street, New York; Bird, Jones & Kenyon, 9 Blandina street, Utica, N. Y.; Foster Rubber Co., 370 Atlantic avenue, Boston, Mass.; G. W. Cole Co., 141 Broadway, New York; Mehlbach Saddle Co., 106 Chambers street, New York; Armour & Co., 175 Duane street, New York; America Co., Rockford, Ill.; Adirondack Guides Assn., Saranac Lake, N. Y.; A. B. Moncure, Reams, Dinwiddie Co., Va.; Anglers Co., Hartford, Conn.; Fraser Hollow Spar & Boat Co., Greenport, Long Island, New York; Motor Boat Pub. Co., 1135 Broadway, New York.

LAUNCHES, MOTOR BOATS, ETC.

Newbury & Dunham, W. 210th street, New York; Am. De Dietrich Motor Car Co., 112 W. 34th street, New York; E. H. Gotshalk Co., 23rd and Hamilton streets, Philadelphia, Pa.; Williams-Whittelsey Co., Long Island City, New York; Buffalo Gasoline Motor Co., Buffalo, N. Y.; H. Neubauer, Palais de l' Automobile, 500 5th avenue, New York; Lamb Boat & Engine Co., Clinton, Iowa; Lozier Motor Co., 1 Broadway, New York; Gas. Eng. & Power Co., and Chas. L. Seabury & Co., Morris Heights, New York; Standard Motor Cons. Co., 180 Whiton street, Jersey City, N. J.; Electric Launch Co., Bayonne City, N. J.; James Craig, Jr., 554 W. 34th street, New York; Smith & Mabley, 515 Seventh avenue, New York; Siegel-Cooper Co., 6th avenue and 18th street, New York; Pierce Engine Co., Racine, Wis.; Truscott Boat Mfg. Co., St. Joseph, Mich.; Panhard & Levassor, 232 W. 13th street, New York.

MOTORS AND ENGINES.

August Mietz, 138 Nott street, New York; Clifton Motor Works, 229 E. Clifton avenue, Cincinnati, O.; Mackay Engineering Co., 149 Broadway, New York; Richardson Engineering Co., Hartford, Conn.; Spaulding Gas Engine Co., 77 Greene street, New York; Mianus Motor Works, Mianus, Conn.; Eagle Bicycle Mfg. Co., Torrington, Conn.; H. W. Hubbard, Middletown, Conn.; Lacey Bros., Brown Cochran Co., Lorain, O.; H. W. Jeffers, 373 Canal street, New York; Wm. H. Brodie Co., 4 Vesey street, New York; Palmer Bros., Cos Cob, Conn.; Edison Mfg. Co., 83 Chambers street, New York; Smalley Motor Co., Bay City, Mich.; Carlyle-Johnson Machine Co., Hartford, Conn.; The Isham Co., Norwich, Conn.; Trebert Auto. & Marine Motor Co., 407 St. Paul street, Rochester, N. Y.; C. L. Altemus & Co., Philadelphia, Pa.; Shaw Propulsion Co., H. J. Dexter, 52 Broadway, New York; Bankers & Merchants Agency Co., 66 Broadway, New York; Geo. Henry Cowen, care Mrs. Grant, Cypress Hills, N. Y.; R. H. Ingersoll & Bro., 52 Maiden lane, New York; Meyer, Limited, 69 E 11th street, New York; Klean-At Mfg. Co., 36 Vesey street, New York; Blauvelt Knitting Co., Newark N. J.; E. M. Grunwaldt, care International Optical Co., 1135 Broadway, New York; The Yeager Furniture Co., Allentown, Pa.

HONOR COAL LOADING DEVICE

A new system of coaling ships has been invented by John B. Honor, 213 Delta street, New Orleans. It is called the Honor elevator system and is designed for the purpose of loading steamers from coal barges running alongside. The coal is lifted by means of a bucket into a hopper and transferred from the hopper through a chute into any desired bunker. It is expected to elevate, trim and bunk 150 tons of coal per hour. The cost of handling coal by wheel barrow is estimated to be about five times the cost of handling it by the Honor system. Mr. Honor has been a stevedore for many years and the device is the result of his observations for the improvement in coaling vessels, especially as the negro coal handlers have always been an uncertain factor to deal with, frequently leaving for the cotton fields when they were most desired on the docks. Mr. Honor is now making arrangements to introduce his new machine at other southern ports.

The latest addition to the battleships of the German navy is the Deutschland, which was launched from the Germania yard at Kiel recently. Her length between perpendiculars is 398 ft. 6 in.; the maximum breadth, 72 ft. 9 in.; and the draught, 25 ft. 1 in.; the displacement being 13,000 tons. The armor belt is 9 in. thick amidships and 4 in. thick at the ends. There are two conning towers, the one at the fore being protected by 12-in. armor and the aft one by 5½-in. armor. The main armament consists of four 11-in. guns mounted in a pair of turrets fore and aft, and protected by 11-in. armor. In the central casemate are ten 6.7-in. guns, and four more guns of the same caliber are contained in separate casemates. There are twenty-two 3.5-in. quick firers mounted on top of the casemates. The fighting tops contain four automatic machine guns of 1.5-in. bore, and four other machine guns of 0.3-in. Six 18-in. submerged torpedo tubes are fitted—four broadside, one at the bow and one at the stern of the vessel. The Deutschland is propelled by three sets of triple-expansion engines, aggregating 16,000 I. H. P., and expected to give a speed of 18 knots. Steam is supplied by six cylindrical boilers and eight water tube boilers, the latter of the Schulz-Thorneycroft type.

Capt. C. T. Gunderson, of Chicago, has been appointed master of the steamer George H. Russel building at St. Clair for the Gilchrist Transportation Co.

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DEVOTED TO EVERYTHING AND EVERY INTEREST CONNECTED OR ASSOCIATED WITH MARINE MATTERS ON THE FACE OF THE EARTH.

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FEBRUARY 16, 1905.

No official record is made in our ports as to whether the foreign ships that convey nine-tenths of our commerce are, or are not, bountied or subsidized. But a record is kept of their nationality and flag. In the fiscal year 1903 the tonnage of the various fleets in our oversea trades was as follows:

	Entered.	Cleared.
Austrian	137,099	132,673
Belgian	283,739	273,794
British	12,512,065	12,534,808
Danish	384,802	389,063
Dutch	751,099	711,639
French	629,512	622,271
German	2,921,742	2,964,996
Italian	537,063	567,575
Norwegian and Swedish	1,723,151	1,750,506
Portuguese	49,643	48,053
Russian	60,421	69,826
Spanish	505,546	505,167
All other foreign	320,774	321,855
Total foreign	20,816,656	20,892,226
American	3,881,036	3,930,938
Total	24,697,692	24,823,164

All of the Austrian tonnage, all of the French, all of the Italian and practically all of the Spanish in this enumeration is known to be bountied and subsidized. In addition, a considerable part of the British tonnage running to the United States, including almost all steamers of fourteen knots and above, belongs to subsidized companies. So also the two great German steamship companies which trade with the United States are either subsidized by the empire or aided in other ways. Indeed, it is undoubtedly true that there is in effect a partnership between the Hamburg-American and North German Lloyd companies and the German imperial government.

Besides, there are in both the British and German fleets in the trade of the United States a number of general cargo vessels which do not directly, or even indirectly, share in any present subsidy or bounty. But these vessels are actually the beneficiaries of the general system of national encouragement to merchant shipping which has long been pursued in Great Britain and Germany. Between 1840 and 1860 almost all British ocean steamships belonged to lines that were subsidized. Great Britain was first in the field as a subsidizer, granting huge sums of money before other nations had learned the effectiveness of this form of aid. It happened that this was just when steamships were being developed. These British subsidies to mail lines betwen 1840 and 1860 enormously stimulated the development of machine shops, iron foundries and steamship building yards in the United Kingdom and gave that country an advantage over all the rest of the world, which it has since maintained. Therefore, though hundreds of British steamers do not receive any subsidy or bounty from their government, they are the results of a system of national encouragement adopted and pursued with great vigor and aggressiveness by the British government in the critical era in the transition from sail to steam and from wood to iron.

Moreover, for many years a tremendously powerful British marine insurance agency, the Lloyd's, discriminated against American shipping principally because of the use of wood instead of iron in the building of sail and steam vessels. This was more effective than any tariff in fostering British ship building and owning. It is one of the causes which drove our splendid American fleet off from the ocean and the British "tramps" which fill our ports now are the direct beneficiaries of that system.

As to German steamers, even when they do not receive direct subsidies or bounties they are helped by the general imperial patronage of maritime interests which goes so far that materials for the use of German-built ships are hauled at cost or less on the state railways, and goods intended for export by German steamers are hauled by these same state railways at rates that make foreign competition impossible.

The Belgian government has a system of mail subsidies which protects its few chief lines of steamers. Holland subsidizes its chief mail lines in the same way. Denmark grants subsidies to one or two mail lines. Norway and Sweden grant mail subsidies and Sweden

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has lately adopted the novel experiment of loaning the public money to ship owners to enable them to build ships and establish new ocean enterprises. Some of this money is paid to Swedish steamers operating between our ports and the Caribbean and West Indies. The Portuguese and Russian ships in our trade are probably not subsidized, but they are significantly few in number.

The only encouragement which the United States now gives to shipping in the foreign trade is the granting of a moderate mail subvention to four or five lines of American steamers—the cost of this being about $1,500,000, or less than Great Britain pays to a single line (The Peninsular & Oriental) and about what Germany pays for the East India and Oriental service. Great Britain now pays in mail and other subsidies between five and six million dollars a year. The amounts paid by other nations will be found on page XIII of the report of The Merchant Marine Commission, a copy of which is enclosed to you.

Though, as has been said, there is no actual record of the proportion of our imports and exports conveyed in foreign ships which receive subsidies or bounties, the government statistics do show that ninety per cent of our imports and exports are conveyed in foreign ships and of these foreign ships it may fairly be said that four-fifths are directly or indirectly the beneficiaries of national aid on the part of their respective governments. Norway, poor and small as the country is, has within recent years turned to the method of bounties to native ship building, but a considerable part of the Norwegian fleet was bought in foreign countries before this policy was adopted.

The effect of foreign bounties and subsidies can perhaps best be shown by citing a few specific instances.

An American steel sailing ship of 3,000 tons, costing $150,000, can make on an average one round voyage in a year carrying grain from our Pacific coast to Europe and returning with some bulky merchandise. That ship would receive under our present laws not one cent of bounty of any kind. A French sailing ship of the same size, costing the same price, would receive for this round voyage a subsidy of $25,000 or upwards from the French government.

The result is that these French subsidies—and the same are given to Italian and Austrian ships—have driven not only American ships out of the Pacific trade, but have driven out also the British ships, for they receive no bounty from their own government. Not one square rigged sailing ship has been built in an American ship yard in recent years. Not one deep-sea steamer is now in the process of construction.

An American line of five steel steamships runs from Puget Sound to Japan, China and the Philippines. It receives from our government for carrying the mails about $4,500 a year. A Japanese line of three steamers running from Puget Sound over exactly the same course, competing with our ships for freight and passenger traffic to and from the Orient, receives about $4,500 a year for carrying our mails and also a subsidy of $330,000 from the Japanese government. Out of the British port of Vancouver, a few miles north, runs a British line of three steamers to Japan and China which receives a subsidy of $291,000 a year from the British government.

One result of this is that the American line, though run by most experienced and capable men, has never paid a dividend, and unless the government grants it at least as much as its foreign competitors receive it will have to be abandoned.

The statement frequently made that European nations pay subsidies and bounties only to very fast ships carrying passengers and mails with very little capacity for cargo is totally misleading. There are very few ships in the world of the very high speed of twenty knots and upwards—because of the enormous space taken up by their passenger accommodations and their boilers and engines. Practically all of these ships are subsidized, but there are, all told, not more than a score in number. Most of the ships of the foreign subsidized lines are vessels that, while carrying mail and passengers, have a moderate speed and have a very large cargo capacity. Such are the ships of the North German Lloyd to the Orient and Australia. Only thirteen or fourteen knots is required of this line and the greater part of the German ships running to the port of New York are of low speed and large cargo capacity. The same is true of the British steamers—no British "greyhound" has been placed on the Atlantic for a dozen years. The new British ships belonging to the old subsidized British companies have been of moderate speed, of great cargo capacity and of large dimensions. Many of them carry passengers, but they carry mountains of merchandise besides. The ordinary "tramps" or freighters pure and simple are becoming a less and less important factor in ocean carrying. More and more is being done by the large vessels of regular lines which provide low rates as well as a regular service. However, as has been said, several nations, including France, Italy, Austria and Spain, grant subsidies and bounties to "tramps." Norway pays construction bounties to "tramps" built in her ship yards. Sweden loans money to ship owners who run "tramps." Japan subsidizes everything. The German "tramps" either belong to the regular state-aided companies or are undoubtedly helped by the general policy of imperial encouragement to maritime enterprises. The British "tramps" are the result of the stimulus given to British shipping general by the liberal subsidies granted by that nation, especially in the period between 1840 and 1860. Thus, though no exact figure can be cited for the proportion of our commerce carried in subsidized or bountied foreign ships, yet it may be said that by far the greater part of our commerce is carried in ships that are aided directly or indirectly by foreign governments.

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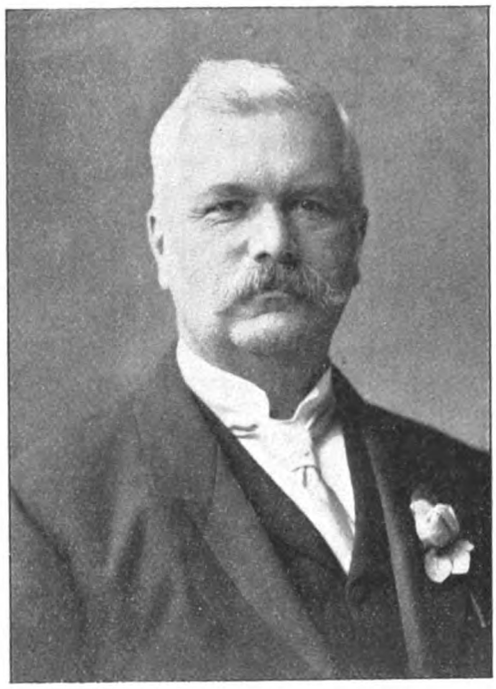
AIDS TO NAVIGATION IN CANADIAN CHANNELS

An address of considerable interest to navigators was delivered at the annual meeting of the Canadian Society of Civil Engineers by Col. William P. Anderson, the retiring president. It was in relation to his own work as lighthouse engineer in the department of marine and fisheries. This department was organized after confederation. Col. Anderson said:



COL. WILLIAM P. ANDERSON.

"At the time of confederation there were throughout Canada 227 lighthouses at 198 stations, and only two of these were equipped with steam fog whistles. Since 1867 there have been established in the dominion, 769 new lighthouses at 598 different stations, seventy-one power fog alarms, fifteen fog bells, ten explosive fog signals, eighty-nine signal buoys, and 106 gas lighted buoys, numbers far exceeding the total establishment of any country in the world except the United States of America, and very little inferior to the aggregate in that country of great wealth and magnificent distances. A majority of these appliances were designed and put in operation under the superintendence of myself, who for a long time, happily now past, enjoyed the distinction of being the only lighthouse engineer in Canada. Of late years our attention has been turned to improving aids rather than to rapidly increasing their numbers. In lighthouse illumination catadioptric lenses are rapidly being substituted for the older fashioned, simpler, and less expensive paraboloidal reflectors, and petroleum vapor burnt under incandescent mantles is taking the place of the ordinary oil light. These petroleum vapor lights are very efficient and economical. Photometric tests show that ten times as much light can be got from the vapor burnt under mantles as from the same oil burnt through wicks. The possibility of increasing the power of our Canadian lights is unfortunately limited by the capacity of our lightkeepers. As long as these officials are put in charge of stations without any previous instruction in their duties, so long will it be necessary to limit the size of the lamps to such as can be managed by ordinarily intelligent men. To place lamps with large, intensely hot flames in the hands of uninstructed keepers is to invite destruction of the buildings and apparatus. Until the appointment of lightkeepers can be restricted to young men nominated to go through a course of preliminary training under competent instructors, with the power of instant dismissal for breaches of duty in the hands of the inspectors, it will be impossible to much further improve our lighthouse installations.

"Most of our gas buoys and some of our small fixed lights are now using acetylene in compressed form as an illuminant, but there are difficulties, not the least of these being its cost, that will militate against its general adoption, especially in the face of a rival so formidable as petroleum vapor. Electricity has never been used to any great extent in our lighthouses for many reasons, one being the liability of the machinery to break down, another the untrained lightkeepers we are obliged to employ. In the vicinity of towns having municipal or private electric plants, electric lights have in a few instances been installed, and operated by the municipal power station. An important advantage of electricity, where it is available, is the facility with which occultations can be produced. In exposed positions on the sea coasts whistling buoys on the Courtenay principle, another clever invention, and the old-fashioned bell buoys, are used more extensively than gas buoys, being better adapted to stand the shock of the waves, and requiring no special attention beyond periodical lifting to remove sea growths and renew the moorings. The work of placing and renewing the eighty-nine signal buoys now in commission, and the thousands of smaller buoys, studding all our harbors and rivers, employs quite a fleet of steam tenders.

"The first Canadian fog alarms were steam whistles. About 1873 reed horns were substituted, from motives of economy, a very simple and fairly effective arrangement, patented in Canada, being adopted. In these machines the lifting of a piston in a steam cylinder compressed air in a larger cylinder immediately above, and forced it through the horn, so that the length of blast was regulated by the stroke of the steam piston. One of these horns has been heard 26 miles under favorable conditions. They were not, however, considered first-rate fog alarms, and when larger grants became available, syrens of the Scotch and English types were adopted as the most powerful sound producers obtainable. A first-class English syren at Belleisle is operated by air compressed half a mile from the syren house, the power being obtained from a Pelton wheel run by water led from the lakes on the hills of the island. This installation has run successfully for many years, the cost of maintenance being a mere trifle.

"The government is now substituting diaphones for all the types of instruments previously used for fog alarms. These instruments are claimed to give a very penetrating sound. They have the advantage over the syren that they can be kept at a constant pitch and if the Canadian patentees succeed in producing perfect resonation they will doubtless prove superior in sound-carrying capacity to any signal yet invented. They are run by compressed air and we are installing oil engines to operate them because it is frequently difficult to obtain fresh water for steam engines at our fog alarm stations. This sound is produced by the free vibration in a slotted cylinder of a very slight slotted piston, the air being admitted in rear of the piston, and escaping through the slots which are alternately opened and closed sufficiently fast to produce a pure musical note."

The following officers were elected by the society: E. Marceau, superintending engineer, Quebec, canals, Montreal, president; C. H. Keefer, Ottawa, D. McPherson, Montreal and G. A. Mountain, chief engineer of the Grand Trunk railway commission, vice presidents; H. Irwin, Montreal, treasurer; Prof. C. H. MacLeod, McGill University, Montreal, secretary; and H. R. Lordley, Montreal, librarian.

The annual meeting of the Cleveland & Buffalo Transit Co. was held last week. The report showed the business of the past year to have been only fair owing to the delay in the opening of navigation and the world's fair at St. Louis. No change was made in the officers of the company. M. A. Bradley is president, George W. Gardner vice president, R. C. Moody treasurer and T. F. Newman secretary and general manager. The directors are M. A. Bradley, George W. Gardner, H. D. Goulder, George W. Avery, R. C. Moody, C. C. Harris and T. F. Newman.

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DIRECTORS OF DETROIT STEAMBOAT COMPANIES

The annual meetings and election of officers of all Michigan marine transportation companies, which were held in Detroit last week, resulted as follows:

Detroit & Cleveland Navigation Co.—W. C. McMillan, president; James McGregor, vice president; Hugh McMillan, treasurer; P. H. McMillan, secretary; B. C. Wilder, assistant treasurer; George M. Black, auditor. The above officers appointed A. A. Schantz as general superintendent and passenger traffic manager and D. C. McIntyre as general freight traffic manager. The directors are W. C. McMillan, James McGregor, Mugh McMillan, George Hendrie and A. A.

Detroit & Buffalo Steamboat Co.—George Hendrie, president; A. C. Angell, vice president; W. C. McMillan, treasurer; B. C. Wilder, secretary; George M. Black, assistant treasurer. A. A. Schantz was appointed general superintendent and passenger traffic manager. The directors are George Hendrie, W. C. McMillan, T. F. Newman, Calvary Morris, F. S. Masten, D. C. McIntyre, A. C. Angell, A. A. Schantz and B. C. Wilder.

Duluth & Atlantic Transportation Co.—Hugh McMillan, president; W. C. McMillan, vice president; Philip McMillan, secretary; George M. Black, treasurer. Directors, above and W. K. Anderson.

White Star Line—A. A. Parker, president; L. C. Waldo, vice president; John Pridgeon, treasurer; C. F. Bielman, secretary and traffic manager; B. W. Parker, general manager. Directors, above and T. H. Newberry, James H. Muir, Robert T. Gray and A. W. Colton.

Nipigon Transit Co.—A. K. Kiefer, president; David Milne, vice president; O. L. E. Weber, secretary and treasurer.

Michigan Navigation Co.—William Livingstone, president, treasurer and general manager; T. W. Palmer, vice president; W. A. Livingstone, secretary.

Percheron Navigation Co.—T. W. Palmer, president; William Livingstone, treasurer; W. A. Livingstone, secretary.

Adams Transportation Co.—John Craig, Sr., president; John Adams, vice president; John Craig, Jr., secretary; Thomas Adams, treasurer and general manager. Directors, above and George L. Craig.

Monroe Transportation Co.—John Craig, Sr., president; John Adams, vice president; John Craig, Jr., secretary; Thos. Adams, treasurer and general manager. Directors, above and George L. Craig.

Whitney Transportation Co.—D. C. Whitney, president and treasurer; John Davell, vice president; Fred G. Austin, secretary.

Wolverine Steamship Co.—John B. Roby, president; Watson M. Freer, vice president; Alex McVittie, secretary, treasurer and general manager. Directors, above and Frank J. Hecker.

Michigan Steamship Co.—Frank J. Hecker, president; Frank E. Kirby, vice president; Alex McVittie, secretary, treasurer and general manager. Directors, above and Watson M. Freer and P. H. McMillan.

Hope Transportation Co.—T. S. Christie, president; C. D. Hayward, vice president; W. R. Stafford, treasurer; T. K. Christie, secretary; John A. Francombe, manager.

Wayne Transportation Co.—John A. Francombe, president and manager; W. G. Tueson, secretary; E. McWilliams, treasurer.

Vulcan Transportation Co.—J. B. Baugh, president; S. A. Baugh, vice president; James Findlater, secretary and treasurer.

American Steamship Co.—Hugh McMillan, president and treasurer; W. C. McMillan, vice president; M. B. McMillan, secretary. Directors, above and M. W. Aldrich and G. M. McMillan.

Northwestern Transportation Co.—Harvey H. Brown, president; S. E. Hartnell, vice president; L. C. Waldo, secretary, treasurer and manager. Directors, above and C. T. Pratt and Stephen Hartnell.

Stewart Transportation Co.—George Peck, president; A. E. Stewart, vice president and general manager; C. F. Bielman, secretary and treasurer. Directors, above and J. H. Barlum and George Lesher.

J. Emery Owen Transportation Co.—J. F. Owen, president; W. J. Gray, vice president and treasurer; Robert T. Gray, secretary.

Ionia Transportation Co.—F. M. Thompson, president and treasurer; E. L. Thompson, vice president; W. M. Kelly, secretary.

PASSENGER LINE APPOINTMENTS

The Detroit & Cleveland, the Detroit & Buffalo and the Cleveland & Buffalo Line have made the following appointments for the season of 1905:

D. & C. Line— City of Detroit: Captain, A. J. McKay; pilot, Malcolm McLachlan; chief engineer, William Huff; purser, Dan E. Cummings; steward, Alfred Welfare. City of Cleveland: Captain, A. McLachlan; pilot, John Lightbody; chief engineer, John Hall; second engineer, William Bailey; purser, John Sughrow; steward, Richard Collins. City of Alpena: Captain, M. Lightbody; chief engineer, A. Phillips; second engineer, P. Fanning; purser, R. S. White; steward, C. McPherson. City of Mackinac: Captain, Fred Simpson; chief engineer, William McDonald; Robert Maxwell.

D. & B. Line.—Eastern States: Captain, D. McLachlan; pilot, Eugene Hayward; chief engineer, J. P. Wells; second engineer, M. E. Sicklesteel; purser, George P. Welz; steward, T. B. Prickett.

Western States: Captain, F. G. Stewart; pilot, K. Graham; chief engineer, A. Carter; second engineer, Joseph Mellin; purser, D. A. McIntyre; steward, A. C. Janke.

C. & T. Line.—State of Ohio: Captain, A. H. McLachlan; purser, George P. Sladden; steward, H. A. Bowie.

City of the Straits: Captain, S. O. Robinson; purser, John Barry; steward, E. Funger.

MEAN STAGES OF WATER

The gage records of the United States lake survey show the following mean stages of water above mean sea level, for January, 1905:

	Stages during Jan.	Higher than during same month last year.	Lower than during same month last year.	Higher than during Jan., 1895.	Lower than during Jan., 1895.
	Feet.	Feet.	Feet.	Feet.	Feet.
Lake Superior	602.46	.....	0.01	.....	0.04
Lake Michigan	580.25	0.35	.....	0.34	.....
Lake Huron	580.37	0.47	.....	0.41	.....
Lake Erie	571.32	0.13	.....	0.09	.....
Lake Ontario	245.93	0.06	.....	1.38	.....

Present fall Lake Huron to Lake Erie, 0.34 foot more than year ago.

W. A. Boole & Son, San Francisco, are building a 125-ton gasoline schooner for the German government. This vessel is for service in the South seas, where it will be used as a police boat in the ports of the kaiser's tropical possessions. The schooner will be 106 ft. long, and, although equipped with a 125 H. P. gasoline engine, will be heavily sparred and have wings large enough to insure independence of auxiliary power. Commodious officers' quarters will be provided in the after end of the vessel and the space usually set apart for cargo will be fitted up for the use of native police. The vessel has a very symmetrical model and all her lines are very handsome and graceful. She will have a speed of 15 knots per hour.

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FREIGHT SITUATION

It is true that ore has never been sold in the United States, either in the quantity or rapidity of sale, as it has been sold during the past month. The sales have been phenomenal and the amounts prodigious. Actual sales made by various shippers for delivery during 1905 are double their normal output. The total movement, figured upon sales of ore actually made, will exceed 30,000,000 tons during the coming season. It would not be surprising if the total movement reached 31,000,000 tons. Of course, the Steel Corporation can sensibly influence this great total, but considering the fact that its furnace capacity is at its maximum with several old furnaces blown in and that it is actually buying pig iron in the open market, it can reasonably be supposed that it will move its usual proportion of the total movement. During 1902, when the total movement was 27,500,000 tons, the Steel Corporation moved 16,500,000 tons. It is therefore reasonable to suppose that on a 30,000,000-ton movement it will move 18,000,000 tons. Actual sales made by the independents would allow a falling off of 1,000,000 tons from the Steel Corporation's proportion and yet comprise a total movement of 30,000,000 tons; so the prediction of 30,000,000 tons can be considered as a conservative one.

Upon this basis the Steel Corporation would want to charter about 8,000,000 tons while the independents, who have also considerable vessel holdings, would be in the market for tonnage far beyond their normal requirements. These circumstances lend especial interest to the opening freight rate and vessel owners are talking freely of an 80-cent rate. Shippers, however, maintain that the rate will be governed by the law of supply and demand and insist that existing tonnage is ample to care for a considerably heavier movement than 30,000,000 tons. The movement of the season of 1904 was, analyzed by months, equivalent to a movement of 30,000,000 tons for a season of ordinary length and the prevailing rate last year was 70 cents. So many things, however, may happen in the ore trade to offset the best laid plans that it is extremely probable that shippers will consent to make the opening rate 75 cents with a 5-cent differential for Marquette. Of course, the Steel Corporation is so large a factor that it can virtually dictate the freight rate, but intimations cast out from certain quarters indicate that the corporation does not look kindly upon a 75-cent rate. This would in a measure distribute ore profits among the vesselmen as ore prices are ruling 50 cents per ton and more higher than they were last year.

The fact that the board of managers of the Lumber Carriers' association has fixed the freight rate on lumber for the opening trips at $2.25 from the head of the lakes can have no effect whatever upon general freight conditions. It is represented as being virtually a reduction of 25 cents from the opening rate of last year, but while the announced rate of the association last year was $2.50 it does not really appear that more than $2.25 was actually paid by lumber shippers generally. Moreover while up to three years ago the output of lumber from the Duluth territory was annually 900,000,000 ft. it has latterly sadly fallen off and the best estimates of movement for the coming season are 410,000,000 ft. The actual condition of the industry would, therefore, operate towards a lower freight rate for this product.

MASTERS AND ENGINEERS

Vessel owners have not as yet begun the appointment of engineers but as there is little real difference between them agreements will be reached with them well in advance of the opening of navigation. In fact a number of owners have already had individual conferences with engineers and have arrived at an understanding. Regarding the classification of vessels submitted by the Marine Engineers' Beneficial association, those that own the large carriers now in course of construction do not believe that a special class should be made for them while so many of their smaller carriers are really in the $150 class limit. They believe that one offsets the other. President Livingstone of the Lake Carriers' association has already met the advisory board of the Marine Engineers' Beneficial association and has arranged for a conference between the advisory board and the executive committee of the Lake Carriers' association in the near future, at which time agreements will be entered into for the season.

TOWING COMPANY AND ITS TUGMEN

While the Great Lakes Towing Co. was unable to reach any agreement at the conference with the Licensed Tugmen's Protective association, it is still hoped that a satisfactory settlement will be made before the old contract expires on April 1 next. The point of disagreement is simply the time off. The tugmen demand every second night and every second Sunday off duty. In reply the towing company offered last year's terms which were every third night and every third Sunday off. As the tugmen refused this there was nothing left for President Edward Smith of the towing company to do but to declare the conference off. He said that the conditions demanded by the union were so onerous that $120,000 would have to be taken out of earnings to meet them. While no date has been fixed for a further conference it is expected one will be held well in advance of the opening of navigation and that the tugmen may be brought to see that their demand is really unreasonable.

DREDGEMEN'S CONFERENCE

The Great Lakes Tug & Dredge Owners' Protective association has been having an all-week session with labor aboard the tugs and dredges and is not through yet. So far it has closed contract for the season with the dredge engineers and cranesmen, making a concession to them of double time for Sundays and time and a half for overtime, should the dredges be required to work at night. Twelve hours is to constitute the day's labor, the same as last year. The chief engineer is to be paid $130 per month, the assistant engineer $100 and the cranesmen $90. Conference is now being held with the dredge firemen and scowmen and after that is concluded the licensed tugmen and tug firemen will be dealt with.

Owing to the World's fair and for various other causes the passenger lines of the great lakes did not do a thriving business last year. The annual financial statement of the Richelieu & Ontario Navigation Co. shows net earnings for the past season of $94,312 compared with $180,632.57 in 1903. The reduction in gross earnings was $105,432, mostly attributable to a falling-off in passenger traffic. Owing to the increase in its freight business the company will lengthen the steamers Hamilton and Spartan each 25 ft. The work will be done by the Bertram Engine Works Co., Toronto. The new steamer Montreal, which will cost $500,000 is nearly completed and will be ready for service at the opening of navigation.

Capt. James Reid of the Reid Wrecking Co., Sarnia, Ont., bought the schooners John Kelderhouse and Belle Hanscomb, the former on private terms in Detroit and the latter at sheriff's auction at Windsor. The Kelderhouse was owned by A. H. Zacharias of Detroit and the Hanscomb by C. A. Chamberlain.

Capt. Walter G. Stewart, Leslie, Mich., will bring out the steamer Frank J. Hecker, now building at the St. Clair yard of the Great Lakes Engineering Works for the Gilchrist Transportation Co. of Cleveland.

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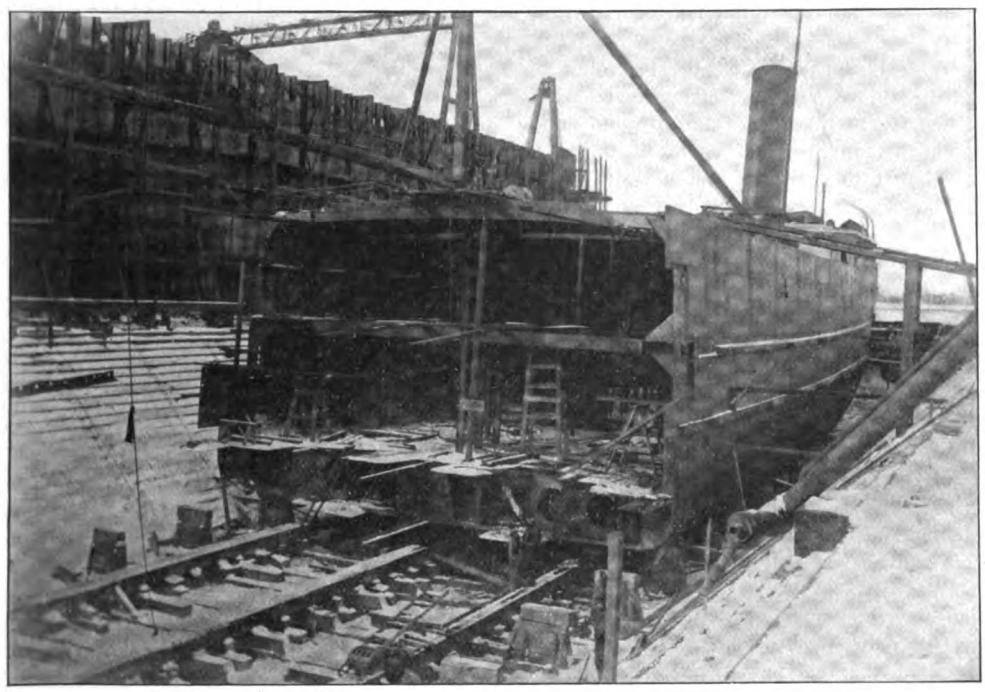
GRAIN SITUATION AT HEAD OF LAKES

Duluth, Feb. 15.—The Grand Republic mill property at Superior, owned by the Standard Milling Co. will probably soon be sold. This and the Duluth Imperial were never considered by the Standard company as available for flour milling purposes, and have been dead property on its hands. Both had been partially stripped of machinery and both are sold with the understanding that they shall not be converted into flour mills. They are, however, valuable for other purposes. The Grand Republic has a grain and cleaning elevator of about 250,000 bu. capacity, and it is supposed the price of the property includes this and some figure for the ground, but little for the building. The latter is a large brick structure well built and in good repair. Both mill and elevator are on the water front near the yards of the Superior Ship Building Co.



LENGHTHENING STEAMER L. C. WALDO 72 FT. AT CRAIG SHIP BUILDING CO.'S YARD, TOLEDO.
Her new dimensions will be 452 ft. between perpendiculars, 48 ft. 2 in. beam and 28 ft. deep.

The stock of northern wheat now in public houses here is 1,274,000 bu., against 530,000 bu. a year ago, and practically nothing at the close of navigation last fall. It is supposed this is being accumulated for delivery on contract sales in the spring. In this connection it is understood that only about 2,000,000 bu. of wheat have been placed here for spring shipment east, and the early movement eastward will be less than for some time. It is probable that a large amount of wheat may remain here during the summer. Stocks now on hand amount to 4,848,000 bu. and it is increasing slowly. Receipts from the country are small and will remain so, for country elevators are growing empty. Shipments by rail that were a factor two weeks ago are now small.

Leading Duluth shippers, who have been feeling the eastern situation, say that the demand for our wheat will be very light and that little will go forward faster than mills can grind it. They look for a total shipment to the east during the summer, up to new crop, of about 5,000,000 bu., which is about 1,000,000 bu. under the corresponding period last year. This being the case the early situation looks rather dull both for grain and charters, with a reasonably fair business during the season. In flax shipments east all rail continue steadily, and exceed receipts to such an extent that last week showed a decrease of 18,000 bu.

There are now better than 4,000,000 bu. oats at the head of the lakes, and of all grains 19,080,000 bu.

There is no effort to fight the bill before the Wisconsin legislature installing a Wisconsin grain inspection, and ousting that of Minnesota. The grain interests at the head of the lake, feel that agitation is sure to continue till such a bill becomes law, and they might as well let it come now as later. They will do the best possible when it passes. Under the provisions of the bill the county of Douglas, in which Superior is, will have to guarantee the costs of the system, and this cannot be less than $35,000 a year, at the lowest rate, and providing a salary of but $1,200 a year for each of the three chiefs, one from North Dakota, one from New York and the other from Wisconsin. It is a question if this guarantee will be given, of course, for the feeling of intense desire for the passage of the bill, prevalent at Superior two years ago, seems to have been replaced by apathy. Whatever may be the result the Duluth board of trade will endeavor to so conform to it as to permit the operation of elevators in Wisconsin with no unnecessary extra costs or difficulty. Of course, on the very face of it, the whole proposition for a Wisconsin inspection is ridiculous and unwise, but there is a certain relatively small sum in salaries and political jobs that are wanted, and there is a class of advertising, whose value is very much over estimated, that Superior thinks it should have.

The Furst-Clark Dredging Co. of Baltimore, has been incorporated to build a hydraulic dredge of which Mr. R. P. Clark is the patentee. Mr. Frank A. Furst, president of the Maryland Dredging and Contracting Co. is president of the new concern. Contract has been given to the Maryland Steel Co., Sparrow's Point, Md., to build the boilers and machinery of the dredge, the hull of which is now being constructed at Orange, La. The dredge will be 167 ft. long, 14 ft. beam and 14 ft. deep.

Naval Constructor Wm. J. Baxter is building at the New York navy yard a novel repair shop. It is 120 ft. long, 40 ft. wide and will draw about 6 ft. of water. Practically every machine used in repair work in a ship yard is installed on this craft and its purpose is to make repairs on vessels when they cannot conveniently be taken to a dry dock. The repair ship is not self-propelling and will, therefore, have to be towed along with the fleet.

A dispatch from Hamburg announces that the directors of the Hamburg-American Steamship Co. have decided to recommend the payment of a dividend of 9 per cent. The net earnings of the company are $7,500,000, of which amount $4,500,000 will be placed in reserve. The sales of steamers and a large amount of business transacted with the Russian government were partly responsible for the extraordinary profits.

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FORECAST OF LAKE SITUATION

Buffalo, Feb. 14.—Somehow it seems to have entered the mind of the ordinary lake man that there is a good season before us. When this idea comes to be analyzed it must be confessed that it has not quite the foundation that it ought to have, yet it may turn out all right after all. Certainly the lakes need something of the sort now, for the downright poor season, such as was the rule last year is not a common experience in this business and the old confidence will be gone if there is not at least a fair showing now.

In the first place there is apparently a liberal amount of ore to be moved and the old vessel owner claims that he has yet to see the good ore season that is not an all-round good season. It is claimed that there is no boom in the iron business and it is well that there is not, yet nobody would say that it is not a long way better, especially from the ore carrying standpoint, than it was at this time last season. And this port is especially favorable to liberal ore receipts from the fact that the Buffalo & Susquehanna furnace will double its output just as soon as it can get the ore.

It does not appear that the new canal up to this furnace is complete yet, so that it may happen that vessels will have to discharge their cargoes somewhere else a good part of the season, but that will not keep the furnace inactive. Then the Lackawanna steel plant is credited with a big amount of business ahead of it and the management has unlimited faith in its possibilities, for it last week voted to borrow $30,000,000 more, to be expended in the running of business, the taking up of some old debts and also in still further extending the plant.

It seems to be time now that an effort is made to use the continuous waterway from the ore beds on Lake Superior to tide water as afforded by the two new ore-reducing plants just mentioned. The old canal fleet is much reduced and cannot meet the needs of a heavy additional traffic, but there were a dozen or more new boats built last season and it is likely that more will be built this season, especially if there is iron for them to carry, or rather grain for the new boats and iron for the less insurable old fleet.

Pursuing my inquiry as to season prospects into the package-freight department it was found that no estimate had been made yet as a rule, answer being made that it was too early to take the matter up yet. The fact is that there is always a disposition to "settle" matters of this sort in comfortable offices much earlier than it is possible to do so with any sort of certainty, so that the mid-winter calculations are about as often proven to be off when the season is on as any way.

The effort of the rail lines leading from points naturally tributary to the lakes to ports of the South Atlantic states and the Gulf to divert freight and especially food stuffs in that direction seems to have alarmed the lake route people and even New York has waked up over the problem of holding her own. These routes being active all the year they are able in the closed-lake season to carry off the surplus freight as soon as it appears, so that there is nothing of account for the lake lines to do when they start up in the spring.

The effort of the New York Central (Western Transit) and Pennsylvania (Anchor) lines to modernize their fleets after the lead of the ore carriers is gradually shifting them over into steamers as large as the terminal facilities will permit. It is said that the new steamer Superior of the Western Transit Line will carry more freight than the Arabia, Vanderbilt and Montana, lately sold, while the Anchor Line has two large new steamers to replace the three sold from that line.

The novel idea of managing the old Ogdensburg Line, now under the name of the Rutland Transportation Co., from here seems to have been from no seeking of General Manager Douglass of the Western Transit Line. The New York Central authorities had come into possession of the line and insisted that here was the place for handling it, so the fleet was thoroughly looked over, its measure taken, so to speak, and this is headquarters for it hereafter. There will be no effort to bring the steamers here for business and so far as traffic warrants they will keep their old routes and act as feeders of the Rutland road. The scarcity of northwestern wheat and flour makes it hard for such a fleet to show a very great percentage of profit.

JOHN CHAMBERLIN.

COAL SHIPMENTS FROM BUFFALO

According to the most reliable figures obtained for coal shipments from Buffalo during 1904, 2,854,193 tons as against 3,190,366 tons in 1903 were moved. The shipments for 1904 were as follows:

Port	Gross tons.	Port.	Gross tons.
Milwaukee	793,290	Dollar Bay, Ont.	2,988
Chicago	709,173	Port Arthur	2,678
Duluth	408,905	Two Rivers	2,020
Superior	317,618	Windsor, Ont.	1,864
Sheboygan	86,157	Manistee	1,378
Green Bay	67,436	Port Washington	1,367
Waukegan	58,235	Alpena	1,264
Fort William	56,808	Marine City	1,251
Racine	50,241	Manistique	1,140
Manitowoc	43,498	Keweenaw	1,135
Toledo	38,632	Muskegon	1,121
Hancock	36,507	St. Clair	1,090
Marquette	23,072	Toronto	1,038
Soo	20,880	Sturgeon Bay	986
Gladstone	17,547	Amherstburg	901
Escanaba	15,345	Kelly's Island	539
Houghton	13,079	Bruce Mines	539
Bay City	13,666	Sandwich	528
Kenosha	10,525	Algonac	497
Lake Linden	10,525	St. Ignace	475
Ashland	9,147	Mackinac	468
Washburn	4,951	Parry Sound	466
Marinette	4,202	Penetanguishene	229
Menominee	4,088	Grand Maries	124
DePere	3,815	Byng Inlet	69
Detroit	3,203		
Port Huron	3,182	Total	2,854,193

The Dominion government ice-breaker, Montcalm, which steamed successfully through 10 in. of ice in December, has been working during the past month with the ice bridge at Cap Rouge, about ten miles above Quebec. At times the ice was formed to the depth of 3 ft., with ice rafted on top of this to a total depth of 15 ft. This the Montcalm was able to pierce at one charge to the extent of her own length, and by repeated charges she has kept the channel open. At times the ice block has formed to even greater thicknesses, but up to time of writing the ice-breaker has dealt successfully with the situation. By preventing the formation of the ice bridge at Cap Rouge, it is thought that navigation on the St. Lawrence will open in the spring at least three weeks earlier than usual.

A campaign is about to be commenced in Liverpool in favor of bounties for British shipping. The special committee of the Liverpool Ship Owners' society, which has charge of the matter, has just held another meeting to draw up its plan. The committee was originally formed by Mr. R. W. Leyland, its chairman, and he still occupies that position, and will play a leading part in the agitation either for bounties for British ships or for countervailing duties against those nations which give bounties to their mercantile marine. Mr. R. W. Leyland has successfully launched many great schemes, notably the International Sailing Ship union, which is now an assured success.

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STEAMSHIP PASSENGER TRADE WITH NEW YORK

Engineering of London, England, has published its annual statistics of passenger traffic between the United States and the United Kingdom and Europe. In view of the St. Louis fair and the steamship war it is surprising that the official records of the number of passengers landed at New York should show a decrease of 8½ per cent. The decrease is probably due to the vigilance of the immigration authorities in rejecting undesirable immigrants. The record for the past fourteen years follows:

RECORD OF ATLANTIC PASSENGER SERVICE TO NEW YORK.

Year.	Number of Passages.	Cabin.	Steerage.	Total.
1890	.....	144,178	371,593	515,771
1891	.....	150,023	445,290	595,313
1892	.....	120,991	388,486	509,477
1893	975	121,829	364,700	486,529
1894	879	92,561	188,164	280,725
1895	792	96,558	258,560	355,118
1896	852	99,223	252,350	351,573
1897	901	90,932	192,004	282,936
1898	812	80,586	219,651	300,237
1899	826	107,415	303,762	411,177
1900	838	137,852	403,491	541,343
1901	887	128,143	438,868	567,011
1902	922	139,848	574,276	714,124
1903	969	161,438	643,358	804,796
1904	967	162,389	572,798	735,187

In all 735,187 passengers were landed in New York, 69,600 fewer than in the previous year. The number of arrivals of ships engaged in the passenger service was 967 which is two less than the previous year. Of the total number of passengers about 78 per cent were carried in the steerage, about 9.35 per cent in the port and 12.65 per cent in the second cabins. As to the lines which carried these passengers during the two years past the following table is complete and illuminating:

RETURN OF PASSENGERS LANDED AT NEW YORK BY PRINCIPAL LINES.

Line.	1904.			1903.		
	First.	Second	Steerage.	First.	Second.	Steerage.
North German Lloyd	15,414	21,684	98,449	15,983	20,048	119,079
Hamburg-American	9,830	14,953	96,140	9,284	14,681	114,458
White Star	13,130	10,942	58,260	12,563	9,855	45,705
Cunard	6,575	13,249	63,027	6,582	11,866	33,716
Red Star	2,933	6,505	39,148	2,597	6,369	54,726
French	4,556	6,905	34,684	4,023	7,479	51,454
American	4,206	4,729	28,316	4,470	6,090	16,081
Holland	3,027	5,140	25,633	3,072	5,398	36,761
Anchor	1,833	6,065	28,047	2,105	6,828	38,564
Atlantic Transport	3,654	.....	90	3,621	.....	6
Scandinavia	665	1,549	19,509	756	1,915	14,642
La Veloce	673	.....	18,885	782	15	31,148
Italian	421	109	17,320	432	1,124	27,379
Fabre	111	.....	17,257	194	.....	25,124
Prince	84	2	8,081	94	.....	16,519
Spanish	370	245	4,383	239	170	5,654
Austria	62	54	4,338			
Allan-State	304	1,301	2,362	296	1,638	1,686
Scandia	.....	4	1,577			
Empreza	18	.....	409			
Italian (Barbadoes)	259	.....	398	89	66	232
Portuguese	3	.....	26	53	.....	1,084

As to the average number of passengers taken per steamer only three lines averaged over 1,000 during 1904. These lines were the Hamburg-American, Cunard and North German Lloyd. The table follows:

AVERAGE NUMBER OF PASSENGERS PER SHIP OF PRINCIPAL LINES, 1904.

Line.	First Cabin.	Second Cabin.	Steerage.	Total.	Total in 1903.
North German Lloyd	146	206	849	1,201	1,367
White Star	130	115	615	860	748
Hamburg-American	108	168	980	1,256	1,135
Cunard	94	193	619	906	802
American	87	98	590	775	605
French	84	128	642	854	1,068
North German Lloyd (Med)	74	103	716	893	1,114
Atlantic Transport	72	...	2	74	68
Holland-American	70	119	596	785	1,005
Red Star	58	130	783	971	1,249
Anchor Line (Glasgow)	43	155	334	532	483
Cunard (Fiume)	30	50	1,145	1,225	
La Veloce	29	...	820	849	1,230
Italian	18	35	666	717	900

CONNECTICUT—LOUISIANA CONTEST

The department of commerce and labor has completed the investigation ordered by the house labor committee on the question of the desirability of the enactment of Gomper's eight-hour bill and the report has been forwarded to congress. An especially interesting feature of the report is the statistical data concerning the Connecticut-Louisiana contest, the Louisiana being built at the yard of the Newport News Ship Building & Dry Dock Co., Newport News, Va., and the Connecticut at the New York navy yard. The statistics on their face would seem to demonstrate the superiority of the eight-hour system when applied to ship building but the labor bureau was careful to explain the reasons for this apparent advantage which are so conclusive as to form a complete offset. The statement merely proves that the New York navy yard is working with the perfect system and straining every energy to prove that it can build a battleship. Every man and every minute is counting with it. The Newport News Co. is building the Louisiana precisely as it would build any other ship without regard to the amount of work performed per man per hour. The committee does not attempt to make any record of cost which is of course a vital consideration in any enterprise.

Summarizing the results of hull construction it is found that the average man at the New York navy yard accomplished as much every ten minutes as the average man at Newport News accomplished every twelve minutes and twenty-five seconds, but in a day of ten hours the average man at Newport News worked in two-tenths of a pound more than the average man in the New York navy yard in a day of eight hours.

It was determined by the Newport News officials that the building of the hull offered the best and most available basis of comparison and they contended and agreed to compile the weights of the structural material worked into the hull and the aggregate hours of all labor employed in the items of hull construction specified by them. The New York navy yard did the same for the Connecticut.

This comparison shows that the average production per man per hour on the Connecticut exceeded by 24.48 per cent the average production per man per hour on the Louisiana, and in the opinion of the labor bureau explains why the progress on the Connecticut in the reports of percentage of work completed to the bureau of construction and repair has kept pace with the percentage reports of work completed on the Louisiana.

The work on the Louisiana has been performed in the regular way and under normal conditions, while that of the Connecticut indicates the putting forth of unusual and extraordinary effort and energy. The reasons why this should be so called for further inquiry into prevailing conditions and elicited the following:

1. Higher rates of wages are paid at the navy yard than by private companies in Greater New York and elsewhere, and the rates of the latter average higher than companies elsewhere.
2. Employment the year around is steadier and more secure than in private yards.
3. The higher wages, shorter hours and steady employment attract the best grade of workmen to the navy yard, where a tacit recognition of an asserted economic theory prevails, that the best workmen cannot be induced to work extra hard without larger pay than the average.
4. Prompt recognition of good work by advance in wages and promotion in grade.
5. A large waiting list of mechanics and others from private shops to select from.
6. The expectation or belief that if the Connecticut was built in record time the building of another battleship would be given the Brooklyn navy yard.
7. A zeal generated by the general challenge of the country to the navy yard workmen to make good their claims in this test.
8. Prompt discharge for inefficiency.
9. Dismissal of workmen who could not or would not come up to a required standard of output in quantity and quality.
10. No restriction of output individually or collectively.
11. Loafing, soldiering or "marking time" not tolerated.
12. Workmen required to begin work the moment the whistle blows, and to continue working until the moment the whistle blows at quitting time.
13. Strict technical and exacting supervision of a high order of skill and experience.
14. A desire on the part of naval constructors and workmen to

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remove an impression of inefficiency growing out of former navy yard construction of war vessels, before civil service regulations controlled employment there.

The report closes with the following pointed comment:

"Former investigations of industrial conditions, together with the facts brought out in this, lead to the following conclusions: Notwithstanding the remarkable achievement of the naval constructors and the workmen at the navy yard, probably unsurpassed in American industrial history, and the other notable examples in some of our great establishments in bringing out the best efforts and energy of their employes, it does not follow, when the facts presented by manufacturers are considered, that an eight-hour work day is possible under prevailing conditions or that labor unions and shop management in general have reached a plane that would make it possible."

CANADIAN SHIPPING NOTES

The outport of Pinette, under the survey of Charlottetown, P. E. I., has been abolished.

The Fredericton and St. John River Navigation Co. has decided to sell its steamer Aberdeen.

The Turbine Steam-ship Co. of Hamilton, Ont., is negotiating with the Toronto city council for increased wharfage accommodation.

The owners of the City of Windsor, met at Collingwood and declared a dividend of 10 per cent on the business for 1904, carrying forward $770.59. The officers for 1905 are: President, C. Cameron; vice president, J. K. McLaughlin; secretary-treasurer, Thos. Long; manager, P. M. Campbell.

The Canadian Association of Marine Engineers held its annual meeting at Collingwood, Ont., Jan. 31 and subsequent days. The association has a membership of nearly 1,000 and the finances showed a balance in hand, after meeting all expenses of $681.17. The delegates from the local associations discussed a number of matters of interest and elected F. Henning, Toronto, grand president, and N. J. Morrison, St. John, grand secretary for the current year.

The steamer Boscowitz which ran ashore on Harbledown island in October, 1904, was bought for $300, patched up, and towed to Victoria, B. C. After being repaired she has now been sold for $5,000 to J. S. Emerson of Vancouver.

The Lady Eileen, which the Interprovincial Navigation Co. is having built at Glasgow, Scotland, for the Bare des Chaleurs trade, will be placed on the run early in May. She will be a 15-knot twin screw, steel steamer, with large cargo capacity, and accommodation for 200 passengers, her dimensions being: Length, 185 ft., over all; breadth, 31 ft.; depth, 12 ft. 6 in. The operating headquarters will be at Campbellton, N. B., F. S. Blair being manager.

The Northern Navigation Co. at its annual meeting reelected the retiring directors with H. C. Hammond as president, for the ensuing year. The annual report showed a decrease of $80,000 in revenue, and of $102,500 in operating expenses for 1904, leaving net receipts of $46,091.23 against $26,397.00 for 1903. The accounts have been brought up-to-date outstanding claims having been cleared off, and disputed accounts adjusted. The outlook is favorable for the resumption of the payment of dividends at the close of the current year.

VARIATION OF SHIP COMPASSES

An appendix to the annual report of the chief of engineers for 1904, relating to the survey of northern and northwestern lakes, contains a report by Maj. Charles L. Potter on the subject of variation of ship compasses on the north shore of Lake Superior. This is one of the most interesting subjects to vesselmen, as boats are always in peril on the north shore, in thick weather, if allowance is not made for the local attraction, which affects the compasses on board. Many serious strandings have been caused by this phenomena and several boats have been lost as a result of it. The big tug Niagara, which was lost on Knife island last May, was the last important disaster due to local attraction of the compass. The official observations were made by J. H. Darling, United States assistant engineer. The object of the work was to ascertain to what extent local attractions of the compass existed over that part of Lake Superior lying west of Devil's island.

The greatest local attraction was discovered near Stoney point, about 2 miles southwest of Knife island and 18 miles from Duluth. There, where the normal variation is about 8 degrees east, a variation as high as 26 degrees east was found, showing a maximum observed local attraction of 18 degrees to the east.

Near Split Rock, 18 miles beyond Two Harbors, the next greatest disturbance of the compass was discovered. There, at a distance of one-fourth of a mile from shore, was found a change in the variation of from 17 degrees east to 5 degrees west, a range of 22 degrees. A second observation, made at a distance of 2,100 ft. from shore, gave variations ranging from 14 to 1 degree east. At 6,000 ft. from shore the range was from 4 to 9 degrees east. The normal variation is not far from 6 degrees east in the locality of Split Rock.

Near French river, 12 miles from Duluth, at a point one mile from shore, the variation was as great as 15 degrees east, showing a disturbance of about 7 degrees. In the course of his report to Maj. Potter, Mr. Darling says:

"There is reason to believe that some masters and vessel owners on the great lakes do not give sufficient attention to the correction of the compass, and the determination of the ship's deviation. There is more reason for care from the fact that the directive force of the earth's magnetism is rather weak in this region as compared with other navigable waters of the globe, and tends to sluggishness of the compass needle."

Capt. John Mitchell has appointed the following masters for the steamers of his fleet: Steamer Stephen M. Clement, Capt. C. B. Galton; steamer Moses Taylor, Capt. F. D. Galton; steamer Frank H. Goodyear, Capt. H. A. Stewart; steamer James Gayley, Capt. H. H. Townsend; steamer William H. Gratwick, Capt. R. C. Jackson; steamer Walter Scranton, Capt. M. M. Stewart; steamer John J. Albright, Capt. J. W. Autterson; steamer William E. Reis, Capt. J. D. Baird; steamer H. C. Frick, Capt. J. B. Lowe; steamer M. A. Hanna, Capt. Alex. Begg; steamer H. S. Holden, Capt. G. E. Anderson; steamer Lagonda, Capt. Ed. Johnston; steamer John J. McWilliams, Capt. Fred Furtaw; steamer Major, Capt. F. R. Hemenger; steamer Robert L. Fryer, Capt. J. G. Sauer.

W. H. Waggoner, general freight and passenger agent of the Hart Steamboat Line, has secured an option from Capt. C. B. Hart of the controlling interest in the steamboat line which consists of the popular passenger and freight steamers Harriet A. Hart, Eugene C. Hart and Fannie C. Hart plying between Green Bay, Petoskey, Mackinac island, Cheboygan and the Sault.

A special from Dunkirk says that Daniel F. Toomey has sold the passenger steamer City of Grand Rapids which formerly ran between Dunkirk and Buffalo to Capt. John Averill of Cleveland.

The old Anchor Line package freighter Juniata, which has been purchased by J. J. Boland of Buffalo, will be renamed Winnipeg.

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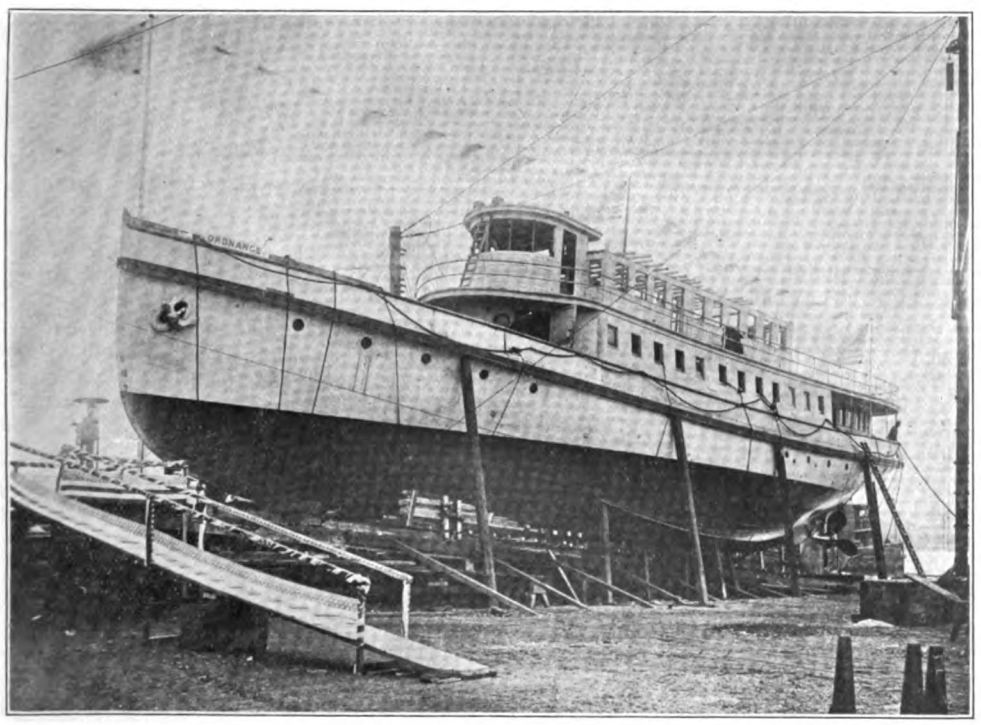
MRS. HORACE H. THAYER CHRISTENED THE ORDNANCE THOROUGHLY WELL.

LAUNCH OF STEAMER ORDNANCE

The steamer Ordnance, building for the ordnance department of the United States army, was launched recently from the ship yard of Pusey & Jones Co., Wilmington, Del. The Ordnance was christened by Mrs. Horace H. Thayer, Jr., daughter of Thomas H. Savery, president of the Pusey & Jones Co. The Ordnance is designed to make daily trips between New York and Sandy Hook where the government proving grounds are located and to act as a general utility vessel in locating targets. Prior to the launch Capt. T. L. Ames, representing Brig. Gen. Wm. Crozier, chief of the ordnance department, delivered an address in which he outlined the work of the ordnance bureau and what the steamer was intended to do. In the launching party were Gov. and Mrs. Preston Lea of Delaware; Mr. Thomas H. Savery, Mrs. H. H. Thayer, Capt. T. L. Ames, Mr. and Mrs. John Harris, Benjamin Neals and United States Engineer C. A. Flager. The photograph accompanying this article will show that Mrs. Thayer broke the bottle of champagne in a most thorough manner and just as the Ordnance was half way down the ways Mr. Wardlow M. Hammond who was on top of the pilot house released two white doves which flew across the river.



THE ORDNANCE JUST PRIOR TO THE LAUNCH.

The Ordnance is 120 ft. long, 112 ft. 6 in. load water line, 26 ft. beam, molded, 13 ft. 10 in. depth molded amidships, 9 ft. 6 in. draught, and is expected to make a speed of 13½ straight miles per hour. The machinery consists of a vertical inverted direct acting compound surface condensing engine, 18 and 36 in. cylinder diameters by 22 in. stroke. Steam will be supplied by a Babcock & Wilcox boiler 9 ft. wide by 10 ft. 1 in. long allowed 150 lbs. pressure. The steamer will be fitted with a combined steam and hand steering gear and a complete fire-fighting apparatus. The vessel will be lighted throughout by electricity.

It is not likely that the newly organized Lake Pilot's association will make much headway on the great lakes during the coming season. Owners of the various fleets are rapidly appointing their masters and the masters are in turn engaging their mates. Some of them are following the lead of the Pittsburg Steamship Co. and are requiring masters to employ mates that do not belong to the union. So far no difficulty in getting mates has been reported and it is expected that the crews will be well lined up before navigation opens.

The Canadian government after correspondence with New Zealand has determined to provide for the establishment of a steamship connection between New Zealand and Vancouver and it is said that $50,000 is being placed upon the estimates as a proposed subsidy. The present steamships sailing between British Columbia and Australia do not touch at New Zealand. The New Zealand parliament has voted Canada a substantial tariff preference and regular means of communication will enable Canadians to take advantage of such an opening for the development of foreign trade.

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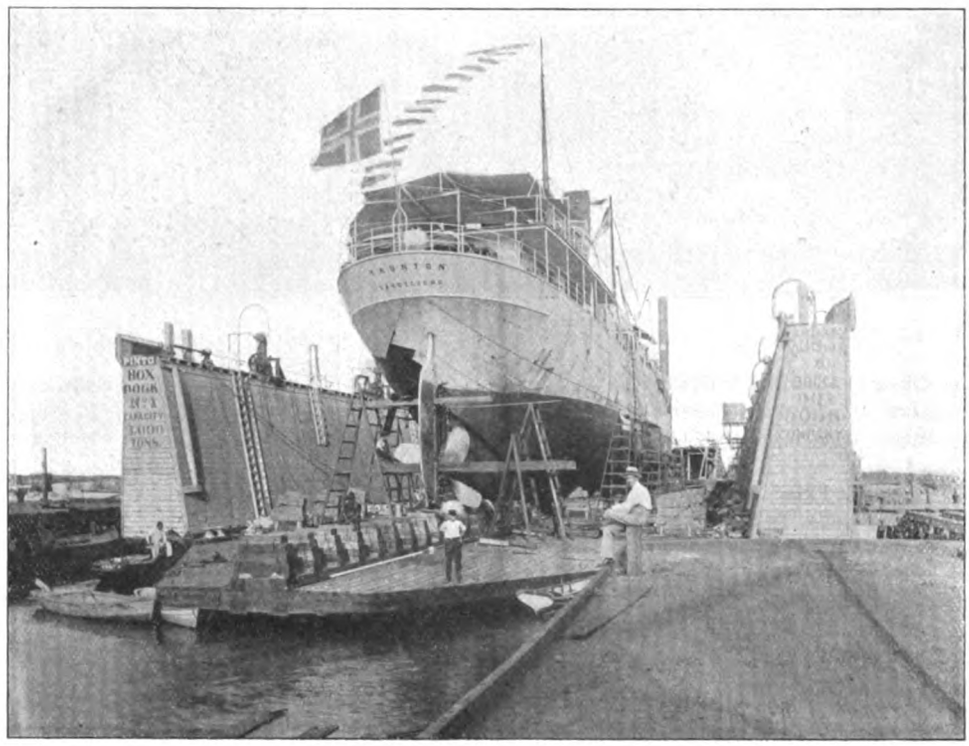
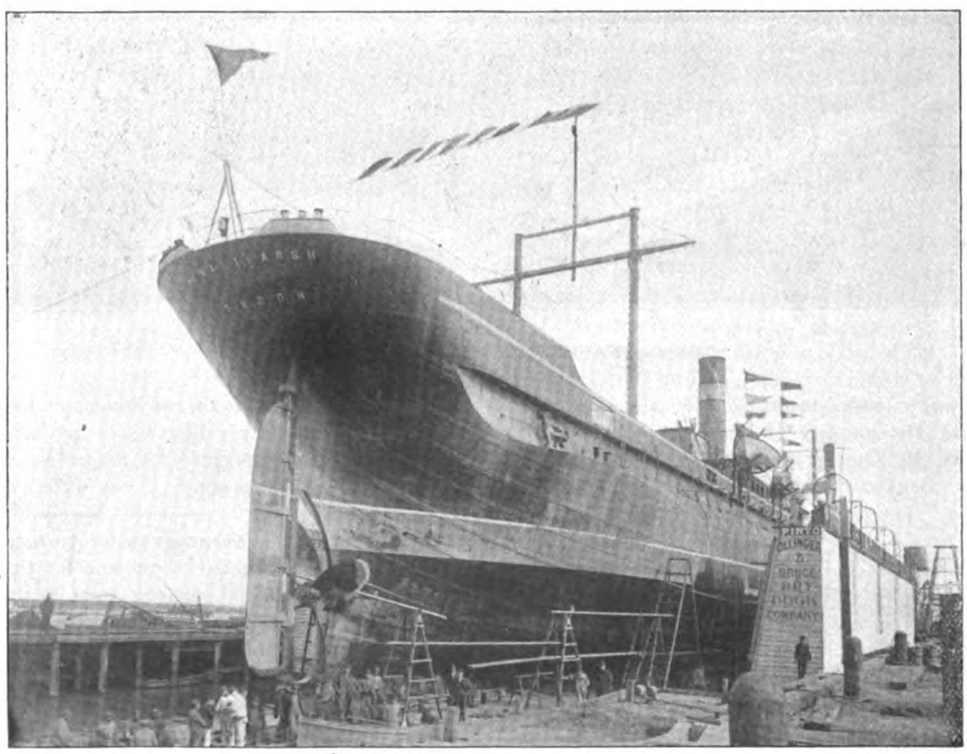
SIR WILLIAM H. WHITE ON OUR NAVY

The program of construction now in progress for the United States navy says Sir William H. White, the creator of the modern British navy, in an article on American ship building in the London Times is of great magnificence. He believes that its completion will add enormously to the strength of the American war fleet, bringing it into a more important position than it has occupied among the navies of the world since the civil war.

"It is well known," he goes on to say, "that the late Mr. Whitney began the systematic development of the United States navy about twenty years ago, and it was my privilege to assist that movement; first, by having as pupils naval constructors sent to Europe for their professional education; and, second, by preparing designs for two of the protected cruisers first built in America. My recent visit, therefore, added little to the statistical and technical information previously possessed in regard to numbers and types of ships. But the special facilities afforded to me by the secretary of the navy, and the cordial reception by the great private firms engaged in the production of naval material, enables me to speak, from personal observation, of many important and interesting matters in relation to American ship building establishments, steel works, and armor-plate factories, as well as American ships. Each month there is published an official summary of the progress of naval construction in the national dock yards and private ship yards of the United States. Taking that dated Oct. 1, 1904, it appears that thirteen first-class battleships, eight first-class armored cruisers, five protected cruisers, two gunboats, five torpedo boats, and three training ships (sailing) were then building. Many of these were practically complete, others were far advanced, and a few were in early stages of construction. With the exception of one battleship and the three training ships, all the vessels were building by private firms, and it is most remarkable that in less than twenty years practically all these establishments should have been created. The magnitude of the program now in process of execution will be better understood if it is compared with corresponding programs for other navies, and it is preferable to confine the comparison to battleships and armored cruisers.



THE NEW FLOATING DRY DOCK OF THE OLLINGER & BRUCE DRY DOCK CO., MOBILE, ALA.; LIFTING CAPACITY 3,000 TONS.



THE NEW FLOATING DRY DOCK OF THE OLLINGER & BRUCE DRY DOCK CO., MOBILE, ALA.; LIFTING THE SALTMARSH OF LONDON.

"The United States have building thirteen battleships of about 193,000 tons displacement, the aggregate cost of which (exclusive of armaments) is about thirteen and one-half millions sterling, and eleven armored cruisers of 140,000 tons, costing about nine and one-half millions sterling. Contracts are

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now being arranged for another battleship of over 16,000 tons and two armored cruisers of 14,500 tons, this group representing more than 45,000 tons, and being estimated to cost about three and a quarter millions sterling. Of the armored cruisers, three are a little under 10,000 tons, six are of 13,700 tons, and four of 14,500 tons. The grand totals are, therefore, fourteen battleships, thirteen armored cruisers, nearly 380,000 tons and twenty-six and a quarter millions, exclusive of armaments.

"For the royal navy at the date of the parliamentary return, including as 'building' the purchased battleships Swiftsure and Triumph, the corresponding figures were ten battleships of about 154,000 tons, costing nearly twelve millions, and thirteen armored cruisers of 157,000 tons, costing about eleven and three-quarter millions. The estimates for 1904-5 contemplated the commencement of two new battleships (Lord Nelson class) of 16,500 tons and four armored cruisers (Minotaur class) of 14,600 tons; the aggregate for these six vessels was 91,400 tons, and their total cost probably amounts to more than seven millions sterling. It is understood, however, that only three armored cruisers are to be commenced in the financial year. If that be so, of the sixteen cruisers seven (Devonshire class) are under 11,000 tons, six will be about 13,500 tons and three of 14,600 tons. The grand aggregate building for the royal navy will then be twelve battleships and sixteen cruisers —total tonnage 388,000 tons and total cost about twenty-nine and three-quarter millions.

"For France the corresponding figures, including two projected cruisers, are six battleships, nine cruisers—195,000 tons and eighteen and one-half millions. The largest battleships have a displacement of 14,650 tons and the largest cruisers of about 14,000 tons.

"For Germany the figures are: Eight battleships and three armored cruisers, the largest battleships having a displacement of 13,000 tons, while the cruisers building do not exceed 9,500 tons, and that projected is said to be 11,000 tons. These ships have an aggregate tonnage of 134,000, and will cost about twelve millions, exclusive of armaments.

"The magnificent addition to the United States navy," Sir William says, "is chiefly due to the war with Spain, which aroused great public interest and made it obvious that a strong navy was a necessity to a power having transoceanic possessions and a growing demand for foreign markets for its manufactures. All the battleships above reckoned as building (except the Ohio, which is now in commission) were laid down from 1899 onward. Five of 15,000 tons were authorized in 1899-1900, two of 16,000 tons in 1902, and three of 16,000 tons in 1903. In the latter year pressure of parliamentary opinion led to the authorization of two battleships of 13,000 tons and 17 knots—vessels first-class in armor and armament, but inferior in engine power, speed, and coal supply to the preceding vessels. This decision was contrary to naval opinion and has not been maintained."

COMPOUND FREIGHT LOCOMOTIVE

The new articulated compound freight locomotive of the Baltimore & Ohio railroad, which is the only one of the Mallot type in the country and by far the largest in the world, was first placed in active service Jan. 3, helping freight trains over the grade from Sand Patch to Rockwood, on the Connellsville division, a distance of 16 miles.

The Baltimore & Ohio railroad had this powerful locomotive built at the Schenectady, N. Y., works of the American Locomotive Co., and as soon as completed it was placed with the road's exhibit at the St. Louis exposition. The latter part of December it was dismantled, taken to the company's shops at Cumberland and put in order for use on the road. An official test run was made between Cumberland and Hyndman, 14 miles, Wednesday afternoon, Jan. 4, which was successful. Sand Patch is 33 miles west of Cumberland and from there to Rockwood the grade ranges from 1.3 to nearly 2 per cent. The heaviest grade is at the rate of about 1,000 ft. to the mile. The locomotive was secured for use in "pusher service" to help freight trains over San Patch hill, on the Allegheny mountains.

It is, in fact, a pair of locomotives with one boiler. The engine, in working order, weighs 334,500 lbs. and the weight of the tender filled with 7,000 gallons of water and 13 tons of coal is 143,000 lbs. It has the greatest heating surface ever put into a locomotive—5,586 sq. ft., of which 219.4 sq. ft. are in the fire box, and 5,366.3 sq. ft. in the tubes, which are 21 ft. long. These proportions outdo anything of the kind designed for a locomotive. The immense power of the locomotive may be conceived in the drawbar pull of 70,000 lbs., which it can exert working compound, or 80,000 lbs. in simple gear. The boiler will carry a working pressure of 235 lbs.

LABOR'S PERCENTAGE FROM THE RAILWAYS.

The Inter-State commerce commission report for the fiscal year ending June 30, 1904, gives many interesting facts indicating the continued increase of railroad employes, and a continual increase in the percentage of the total receipts paid back to the men who run the railroads. The following table gives the gross and net earnings of all the railroads in the United States with the amount of wages paid out, and the percentage of the wages to the gross earnings, and the percentage of wages to operating expenses:

	Gross Earnings.	Operating Expenses.	Net Earnings	Total Wages.	Per Cent of Wages to Gross Earnings	Per Cent. of Wages to Operating Expenses.
1897	$1,122,029,773	$ 752,524 764	$369,565,009	$465,601,581	41.4	61.1
1898	1,247,325,621	817 973,276	429.352,345	495,055,618	39.6	58 2
1899	1,313,610.118	856,968,999	456,641,119	522,867,896	39.8	61.
1900	1,487,044,814	961,428,511	525,616,303	577,264,841	38 9	60.
1901	1,588 526 037	1 030,397,270	558,128,767	610,713,701	38.5	59.3
1902	1,726,380,267	1.116,248 747	610,131,520	676,028 592	39.	60.
1903	1,900,846,907	1,257,538,852	643,308.055	775,321,415	40 8	62.

These tables demonstrate that out of every $100 received by the railroads, $40.80 was immediately paid out to the employes thereof; that out of every $100 paid out for expenses, $62 went as wages. If it is considered that practically all of the remaining $38 of expenses was used in purchasing materials and supplies, and that a large percentage of the cost of these represents wages, it is safe to estimate that not less than 80 per cent of the expenses of the railroads is money paid out, directly or indirectly, to labor.

It naturally follows that if railroad revenue is reduced there must be expense reductions to meet the new conditions.

As a direct result of the Slocum disaster Senator Jacob Marks of New York city has introduced two bills in the legislature at Albany which aim to regulate the use of steam vessels for excursions in the waters of New York state. The bills provide that the heads of the fire departments in every locality where steam vessels are used for excursion purposes shall have a uniformed member of the department for duty on each deck of the vessel and one for each barge whose duty it will be to patrol decks, inspect the fire apparatus and cooperate with the crew or take charge of the fire fighting and emergency. It is further provided that the owners of the steamers to be used for excursions must inform the fire department a day in advance of any excursion. It is further specified that the superstructure of such steam vessels shall be hereafter of iron and steel and owners may be allowed until May 1, 1907, to remodel the craft.

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SUMMARY OF NAVAL CONSTRUCTION

The monthly summary of construction, prepared by the bureau of construction and repair of the navy department shows a slight gain of the Louisiana over the Connecticut but as pointed out elsewhere in this issue it is probably more an apparent than a real gain. Commendable progress is being made on all craft as the summary shows:

		Degree of completion, per cent. Jan. 1,'05.	Feb. 1,'05.
BATTLESHIPS.			
Virginia	Newport News Co.	75.24	76.96
Nebraska	Moran Brothers Co.	64.91	65.80
Georgia	Bath Iron Works.	71.94	73.61
New Jersey	Fore River Shipbuilding Co.	74.30	75.70
Rhode Island	Fore River Shipbuilding Co.	77.10	80.70
Connecticut	Navy Yard, New York.	61.51	64.51
Louisiana	Newport News Co.	60.50	67.80
Vermont	Fore River Shipbuilding Co.	31.50	35.40
Kansas	New York Shipbuilding Co.	40.10	41.30
Minnesota	Newport News Co.	52.84	55.70
Mississippi	Wm. Cramp & Sons.	17.84	20.00
Idaho	Wm. Cramp & Sons.	15.39	18.09
New Hampshire	New York Shipbuilding Co.		0.00
ARMORED CRUISERS.			
Pennsylvania	Wm. Cramp & Sons.	98.25	99.25
West Virginia	Newport News Co.	98.50	99.25
California	Union Iron Works.	68.70	70.80
Colorado	Wm. Cramp & Sons.	99.27	100.00
Maryland	Newport News Co.	95.14	96.50
South Dakota	Union Iron Works.	65.90	67.90
Tennessee	Wm. Cramp & Sons.	60.53	63.13
Washington	New York Shipbuilding Co.	60.70	62.70
North Carolina	Newport News Co.		0.00
Montana	Newport News Co.		0.00
PROTECTED CRUISERS.			
Chattanooga	Lewis Nixon.	99.13	99.13
Galveston	Wm. R. Trigg Co.	96.00	97.00
St. Louis	Neafie & Levy Co.	53.50	56.70
Milwaukee	Union Iron Works.	65.10	66.70
Charleston	Newport News Co.	88.32	90.22
GUNBOATS.			
Dubuque	Gas Engine & Power Co.	77.60	85.70
Paducah	Gas Engine & Power Co.	73.10	76.20
TRAINING SHIPS.			
Cumberland	Navy Yard, Boston.	88.00	91.00
Intrepid	Navy Yard, Mare Island.	72.00	78.00
TRAINING BRIG.			
Boxer	Navy Yard, Portsmouth.	96.00	97.00
TORPEDO BOATS.			
Stringham	Harlan & Hollingsworth.	99.00	99.00
Goldsborough	Wolff & Zwicker.	99.00	99.00
Nicholson	Lewis Nixon.	99.00	99.00
O'Brien	Lewis Nixon.	99.00	99.00

AN ENJOYABLE SMOKER

After the Marine Engineers' Beneficial association had concluded the serious part of their labor at Washington a smoker was held at the New Willard Hotel which was voted by all present to be a most enjoyable affair. Royal entertainment was provided by Mr. J. W. Armour of Power, Mr. Frank J. Corbett of the Ashton Valve Co., Mr. Herbert Self and Joseph McKenna of the Crandall Packing Co., Mr. J. Lloyd Wilson of the Swan & Finch Co., and Mr. Wm. C. Redmond, Mr. C. Howard Sheck and Mr. Henry Frantzen. Besides officers and delegates the smoker was attended by the following guests:

Admiral Charles R. Rae, engineer-in-chief United States navy; Senator Cormack, Geo. Warrington, engineering department of United States lighthouse service; Geo. A. Anthony, quartermaster's department United States army; W. J. DuBoiss, chief engineer American Mail Steamship Co.; Geo. Uhler, supervising inspector general of steam vessels; Anthony Savage, engineering department United States lighthouse service; W. H. Smith, United States navy; Gavin Hamilton, superintending engineer commission charities, New York; Frederick Low, editor Power; John W. Oast, United States inspector steam vessels, Norfolk, Va.; Chas. W. Martin, of Jenkins Bros., New York; C. H. Wescott, United States inspector steam vessels, Detroit, Mich.; John Coleman of Babcock-Wilcox Co., New York; W. J. Condlow, Standard Oil Co.; W. F. Yates, manager marine department, Dearborn Drug & Chemical Co., New York; Reuben Row, United States lighthouse engineering department; H. N. Parker, engineering department United States lighthouse service; Daniel E. Lynn, marine department, National Lead Co., New York; C. J. Hutchins, United States navy; Ira Harris, United States inspector steam vessels, New York; John Cotter, United States inspector steam vessels, New Orleans; John Benham, United States inspector steam vessels, San Francisco; R. J. Willtage, United States inspector steam vessels, St. Louis; J. W. McGilvary, Peerless Rubber Co., New York; Ingles Leslie of Leslie Reducing Valve Co., Paterson, N. J.; N. J. La Varre, United States lighthouse service; F. J. Corbett, Ashton Valve Co., New York; Lewis Bernier of James Reilly Repair & Supply Co., New York; H. N. Bennett of Bird Anchor Co., R. D. Jackson, New York Belting Packing Co.; I. D. Lyon of Garloch Packing Co.; H. B. Evans, Crandall Packing Co., New York; S. J. Bowling of Philip Carey Manufacturing Co. of Detroit, Mich.; J. S. Wilson, Swain Finch Co., New York; Otto H. Tiltman, superintendent of coast survey.

AROUSED OVER ERIE CANAL OPPOSITION

The business men of New York are aroused over the activity now being displayed by the opponents of the enlargement of the Erie canal to frustrate the carrying out of that design by litigation. Henry B. B. Hebert, president of the Produce Exchange, New York, accompanied by thirty-three men representing various large industrial enterprises appeared before Governor Higgins recently to protest against any change in the canal improvement law as it stands at present. The delegation to President Hebert was as follows:

Produce Exchange canal committee: Gustav H. Schwab, chairman; Frank Brainard, Franklin O. Quinby, Evan Thomas, Wm. H. Douglas, John V. Barnes, Frank E. Hagemeyer, E. C. Bodman, John J. D. Trenor. Canal Association of Greater New York: Emil L. Boos, Charles A. Schieren and Frank S. Witherbee. Frank S. Gardner, secretary New York Board of Trade & Transportation; S. Christy Mead, secretary, Merchants' association; C. B. Parsons, president Maritime association; George Clinton, Buffalo Chamber of Commerce; T. S. Fassett, Buffalo; R. R. Hefford, Buffalo; Frank S. Dudley, Niagara Falls; John D. Kernan, Utica; F. O. Clarke, Oswego; James F. Maury, Cotton Exchange; Alfred Romer and Jesse L. Hopkins, Manufacturers' association; Albert Kinnel, chairman, Canal league; Geo. W. Fortmeyer, president, Linseed association; R. S. White, president, New York Lumber Trade association; E. S. Walsh, New York Canal Forwarders' association; Antonio Zucca, Italian Chamber of Commerce; W. E. Cleary, Canal Boat Owners' & Commercial association; H. L. Waldo, president, Paint, Oil & Varnish club; G. Waldo Smith Wholesale Grocers' association; I. T. McKnight, Flushing association and East End Taxpayers' association.

Mrs. W. S. Mack has disposed of her interests in the steamers W. H. Mack and F. B. Squire to Charles O. Jenkins and others of Cleveland. Mrs. Mack will continue to operate the steamers W. S. Mack, P. P. Pratt and the schooner Athens.

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ITEMS OF GENERAL INTEREST

The old Mathew Turner ship yard at San Francisco has been put in operation again by A. E. Chapman, Benicia, Cal.

Quite a number of improvements have been made at the workshops of the Portsmouth navy yard so that they are now most efficiently equipped as far as machines are concerned.

Cobb, Butler & Co., Rockland, Me., are having the frame cut for a four-masted schooner. The schooner which they are building for Crowell & Thurlow will be launched Feb. 21.

The Gulf & West India Steamship Co. has been formed to run a line of steamships semi-monthly from New Orleans to Cienfeugos and Santiago beginning with the sailing of the steamship Alps.

The American Line has adopted the Stewart patent thermotank system of heating and ventilating its steamships. The invention is owned by Alexander W. Stewart, consulting engineer of Glasgow.

The firm of Liljegren & Clark, naval architects, engineers and yacht brokers, 45 Broadway, New York, has been dissolved, and Montgomery H. Clark will hereafter carry on the business at the old address.

The Newport News Chamber of Commerce will have a bill introduced in congress to dredge the channel over Middleground bar, leading to the port, to a depth of 35 ft. The present depth is 30 ft. at mean low water.

The property of the Norwalk Steamboat Co., South Norwalk, Conn., has been leased for a period of years by Anning J. Smith, Bridgeport, Conn. C. C. Hageman, Bridgeport, Conn., has been appointed general manager.

The new officers of the Bath Iron Works, Bath, Me., are Charles L. Hutchinson, Portland, Me., president; John H. Ridge, Portland, treasurer; John S. Hyde and E. W. Hyde of Bath and David W. Snow of Portland, directors.

The Institute of Naval Architects will hold its annual meeting in the hall of the society of arts, John street, Adelphi, London, on Wednesday, April 12 and two days following. The Earl of Glasgow, president, will occupy the chair.

The Quebec Steamship Co.'s new twin-screw steamer Bermudian built by James Laing & Sons, Sunderland, Eng., has just left New York on her maiden voyage to Bermuda. The Bermudian is 425 ft. long, 50 ft. beam and 36 ft. deep.

The British steamship August Belmont, after receiving forty new plates and a fresh coat of paint, has returned to Baltimore where she will load a cargo for Tampico. The Belmont grounded in Tampico harbor several weeks ago.

A meeting of steamboat owners was held last week in the office of John G. Wise, 20 Broad street, New York, to discuss the changes recommended in the rules governing the inspection of steam vessels by the board of supervising inspectors.

At a meeting of the creditors of the M. B. McDonald & Sons Co., Mystic, Conn., W. G. Brennan and C. Q. Eldridge of Mystic, Conn. were appointed trustees of the plant. They will complete the work upon the five vessels now building at the yard.

The house committee on merchant marine and fisheries has authorized a favorable report on the bill prohibiting the use of foreign-built dredges on harbor work in the United States. The bill should go further and prohibit the use of government-built dredges in private work.

Representative Baker of New York has introduced a resolution in the house of representatives at Washington to investigate the record of Secretary of the Navy Morton in regard to rebates. The resolution reports that Mr. Morton defended rebates while second vice president of the Sante Fe railway system.

The government dredge St. Johns, the hull of which was built by the Greenport Basin & Construction Co., Greenport, N. Y., and the machinery for which was supplied by the James Reilly Repair & Supply Co. of New York, recently underwent a successful three days' trial of her seagoing and dredging qualities.

The four-masted schooner Alice May Davenport, the 312th vessel built by the New England Ship Building Co., Bath, Me., was launched last week. Her official dimensions are: Length, 182 ft.; beam, 30 ft.; depth, 18 ft.; gross tonnage, 1,181. She was christened by Miss Annie Kimball, daughter of Capt. Fremont Kimball of Bath, Me.

George W. Spearin of New York, who recently was awarded the contract for the construction of a dry dock at the New York navy yard, at his bid of $773,292, has signed the contract, and his bond having been approved by the legal officers of the department it is expected he will begin work on the structure without further delay.

At the annual meeting of the Stoddard Manufacturing Co., Rutland, Vt., last week M. O. Stoddard was elected president, M. K. Chaffee vice-president, J. H. Wood treasurer and Ralph Stoddard secretary. The firm is manufacturing all styles of speed and pleasure boats and launches. This department is in charge of Capt. J. W. Chapman.

Mr. R. Stueler, naval architect of Baltimore, Md., will superintend the construction of the new wooden steamer to be built by Rodermond Bros., Tompkins Cove, New York, for the United States revenue cutter service to be used on the Maine coast. The engine and boiler for the steamer will be constructed by the Pusey & Jones Co., Wilmington, Del.

PERSONAL

Rear Admiral George F. Wilde, who has been commandant of the Charleston navy yard since June last, has applied to be put on the retired list under the forty-year active service clause. Admiral Wilde is one of the most popular officers of the navy and was graduated from the naval academy in 1865. His first sea service was on the sloop of war Susquehanna. His last sea service was in command of the battleship Oregon.

Mr. D. K. Smith, superintendent of the Cleveland & Pittsburg ore dock, Cleveland, who resigned recently was presented with a variety of gifts by the several departments under him, including a masonic charm and ring and a solid silver tea service. Mr. Smith had been connected with the work for eleven years, having started as foreman for J. W. Ellsworth & Co.

OBITUARY

Mr. Harrison H. Taylor who died at his home in Detroit recently was in many ways a most extraordinary man. He possessed an inventive capacity which manifested itself throughout his entire life. While a young man he invented a screw machine for which the Detroit Screw Works was incorporated in 1880 to manufacture. He later left this company to engage more largely in general screw machine manufacture. His inventive genius, however, was not confined exclusively to this line of industry, but found expression in various other ways. He was especially fond of the water and concluded from certain experiences with racing in his little yacht the Dream with fast liners in the Detroit river that the accepted plan of building marine boilers was wrong. The Taylor water-tube marine boiler was the outcome of this observation. While Mr. Taylor had been in failing health for about two years his death was indeed very sudden and his place is not one that can readily be filled.

Great regret is expressed in vessel circles over the death of Capt. George L. DeWolf, local inspector of steam vessels at the port of Cleveland. The funeral was held from his late residence in Cleveland and the interment took place at Conneaut.

Capt. William Dana, one of the oldest vessel masters on the lakes, died at Algonac, Mich., last week. He was ninety-two years old.

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THE GUNNELL PNEUMATIC FORGE

The pneumatic forge designed and built by the Gunnell Tool Co. of Manitowoc, Wis., is in portability and efficiency intended as a useful adjunct to pneumatic riveters, though as will be seen it has all the requirements for a wider field. The hollow cylinder above the fire holds the fuel, as in the familiar base burner, and the fuel is fed to the fire in a highly heated condition. The cylinder and funnel arrangement from which the air hose is led forms an efficient draft inducer and a steady and easily regulated air supply is maintained. The upper part of the forge is pivoted and the workman can readily reach any rivet by rotating the pan. This last is a considerable convenience and saves time in traveling around the fire and at the same time presents the rivet handily. The forge weighs only 50 lbs. and will heat twenty rivets at a time. The manufacturers claim that the heating capacity is easily 200 rivets per hour and the forge requires but 2 cu. ft. of air per minute.

THE GUNNELL PNEUMATIC FORGE.

TRADE NOTES

The Hohmann & Maurer Mfg. Co., Rochester, N. Y., had an imposing exhibition of thermometers at the recent Canners' convention in Columbus. They were represented by Herbert J. Milker, 119 Lake street, Chicago.

Termaat & Monahan Co., Oshkosh, Wis., have just issued a beautiful catalogue devoted to two and four-cycle marine engines. The catalogue is clear and comprehensive and explains the various points of these marine engines. To anyone desiring an engine for a launch this catalogue contains most invaluable descriptive matter and is well worth writing for.

The Electro Dynamic Co., Bayonne, N. J., has just put out some bulletins in relation to inter-pole, variable speed motors. In reference to this motor the manufacturers say that it can be set to run at any speed between 275 and 1,400 revolutions per minute and will maintain this set speed without perceptible variation whether operating under no load or full load. The bulletins are descriptive of the motor in detail and are well worth writing for.

The Chicago Pneumatic Tool Co., Fisher building, Chicago, advise their customers that they have taken over the control of the Chicago Storage Battery Co. with the factory located at 1255 Michigan avenue, Chicago, and in addition to manufacturing a full line of compressors and pneumatic tools and appliances they are now in position to furnish the Duntley air-cooled electric drills, and also storage batteries for every purpose for which storage batteries are adaptable.

The Watson Mfg. Co. of Jamestown, N. Y., has recently been allowed a patent on a very meritorious all metal window screen composed entirely of non-rustable material. The screen works on the same principle as the wooden frame screens, which the firm has been manufacturing and will continue to manufacture. In high grade modern buildings a screen better than those of wood frames has long been demanded and this need the Watson screen is designed to fill adequately. The screen has several features of advantage, briefly as follows: It is comparatively light in weight, the wire cloth is very smoothly and tightly stretched, lifts are convenient and inconspicuous. In case of breakage of springs, which is a common fault with many screens, the spring used in the Watson screen can be removed and replaced without the use of tools. Strength and durability are prominent features and one has only to compare it with others now in use to become aware of its superiority in all points. This company is already well known throughout the country for its meritorious productions of wood screens and sliding and venetian blinds. From the demonstrable advantages of the new metal screen, together with the full line of other work produced by this company, its representatives will have a very superior and complete line. Agencies will be placed in all principal cities where the company is not already represented.

One of the most difficult problems ever presented in connection with ship building has been that of manufacturing a successful paint to protect the submerged bottoms of iron vessels. Rust is a natural enemy of iron, and salt water increases its enmity to a very great extent, so that the making of a paint that will remain hard under water, possess tenacity enough to contend against the incessant friction, and thus check the ravages of rust, is no easy matter. After the applications of such an anti-corrosive paint comes the difficulty of producing an anti-fouling paint for the second coat. This, it is conceded, must be poisonous in nature, but without harming either the under coat or the iron. Equally difficult with these problems is that of manufacturing an anti-fouling composition to protect the bottom of wooden vessels. Many poisonous ingredients were tried from time to time, until some years ago copper oxide began to gain favor and today it is generally used. If properly manufactured it gives the results desired, but out of the many manufactured copper paints only a few have obtained any degree of success. Marine paint production has become a specialty in the paint line, and today one of the largest and most successful producers is the New Jersey Paint Works (Harry Louderbough, proprietor), Jersey City, N. J., whose productions are now sold all over the world. In their foreign introduction labels in seven foreign languages are used.

SHIP BUILDING DURING JANUARY

The bureau of navigation reports thirty-four sail and steam vessels of 7,396 gross tons were built in the United States and officially numbered during the month of January, 1905, as follows:

Districts.	Wood.				Steel.		Total.	
	Sail.		Steam.		Steam.			
	No.	Gross.	No.	Gross.	No.	Gross.	No.	Gross.
Atlantic & Gulf:	8	3,302	7	334	3	3,130	18	6 766
Porto Rico								
Pacific			4	207			4	207
Hawaii								
Great Lakes			1	11			1	11
Western Rivers			11	412			11	412
Total	8	3,302	23	964	3	3,130	34	7,396

Henry S. Manning has sold to his partner Charles A. Moore his entire interest in the firm of Manning, Maxwell & Moore and in the various manufacturing concerns owned and controlled by the firm as follows: The Ashcroft Manufacturing Co., Bridgeport, Conn.; the Consolidated Safety Valve Co., Bridgeport; the Hancock Inspirator Co., Boston, Mass.; the Hayden & Derby Manufacturing Co., Boston, and the United Injector Co., Boston. This dissolution ends a partnership of twenty-five years.

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VOL. XXXI. CLEVELAND, O., FEBRUARY 16, 1905. No. 7.

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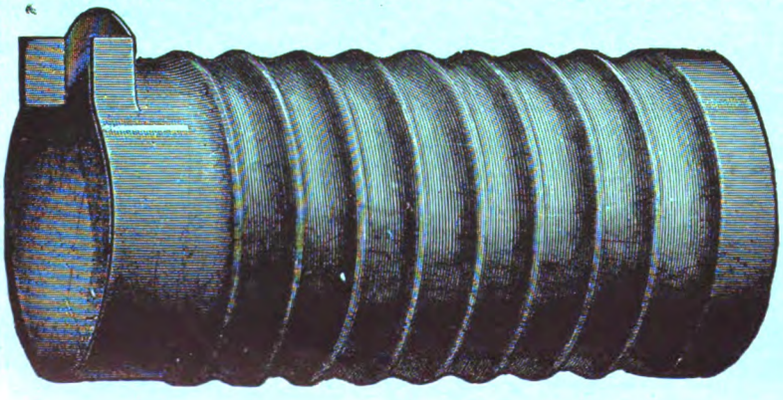

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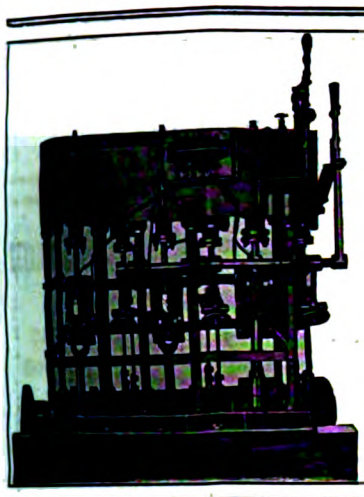

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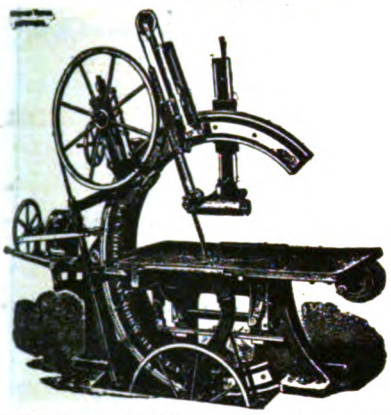

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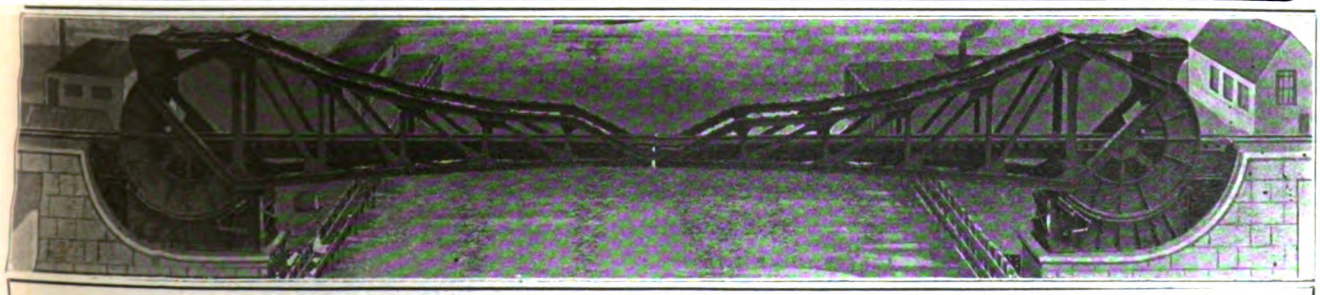

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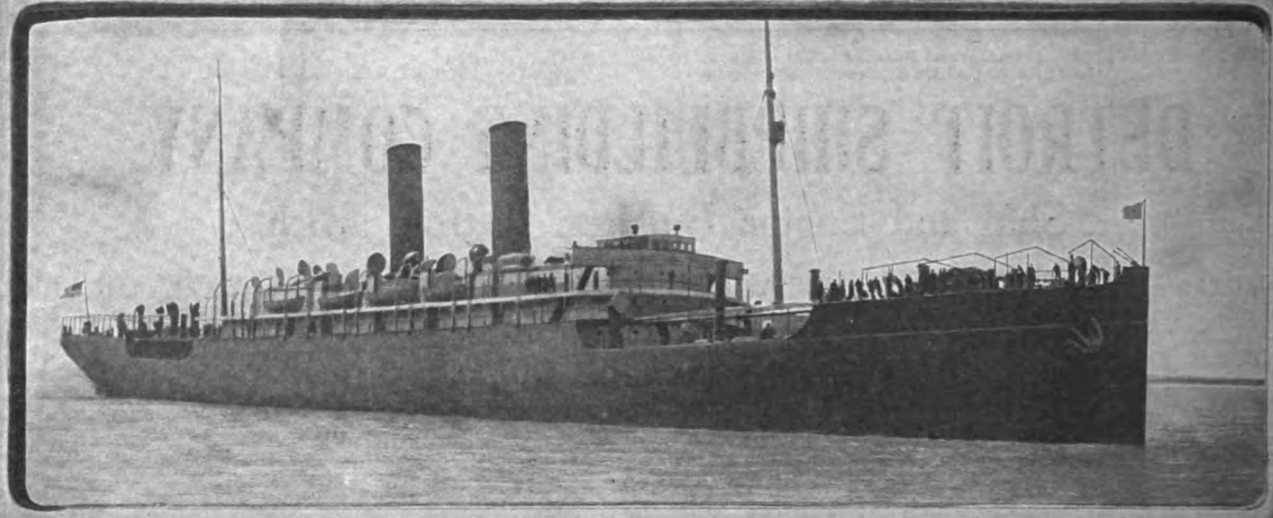

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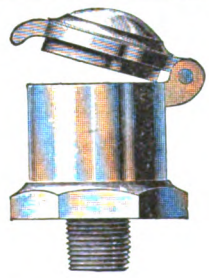

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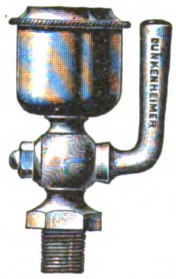

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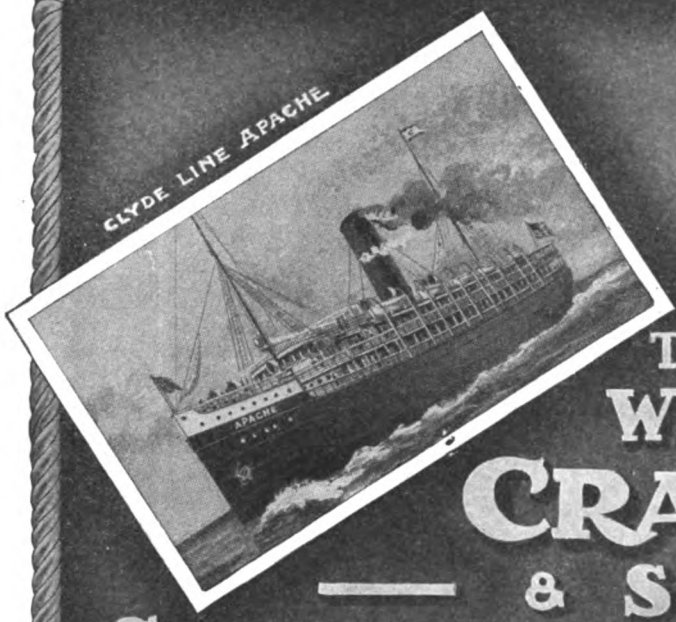

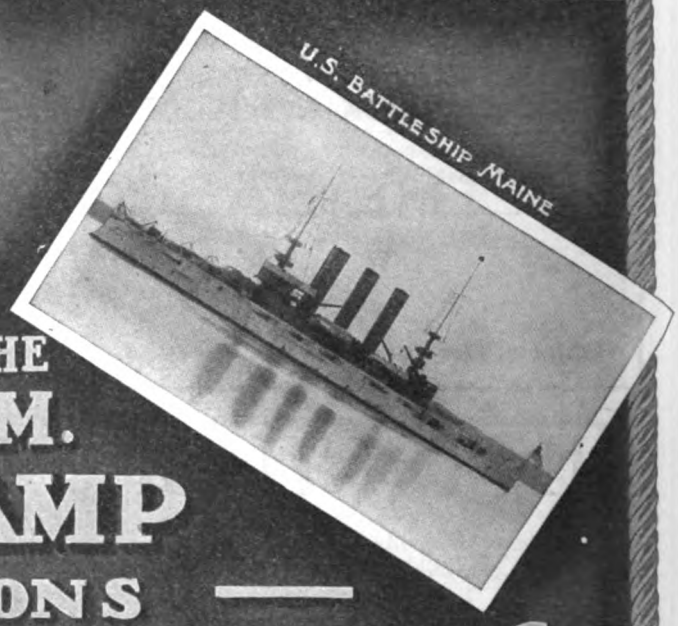

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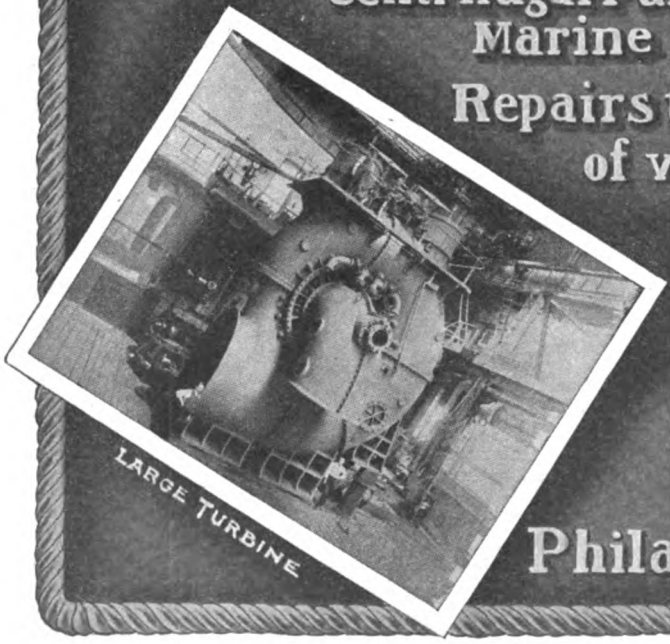

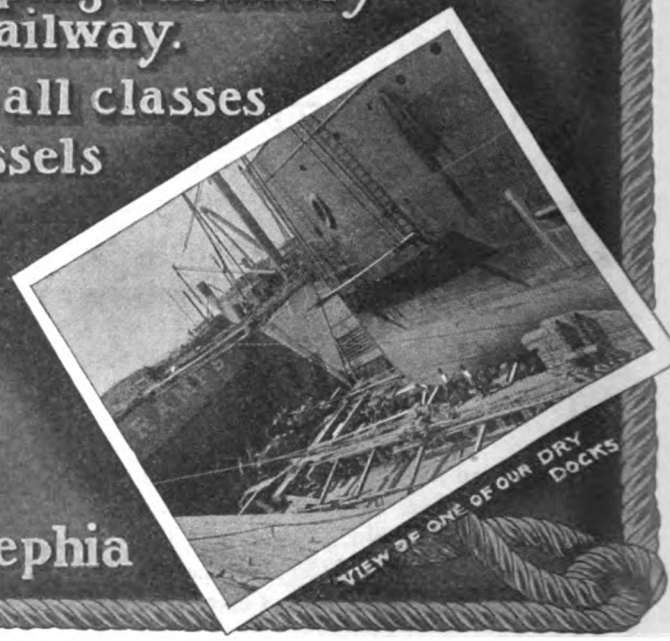

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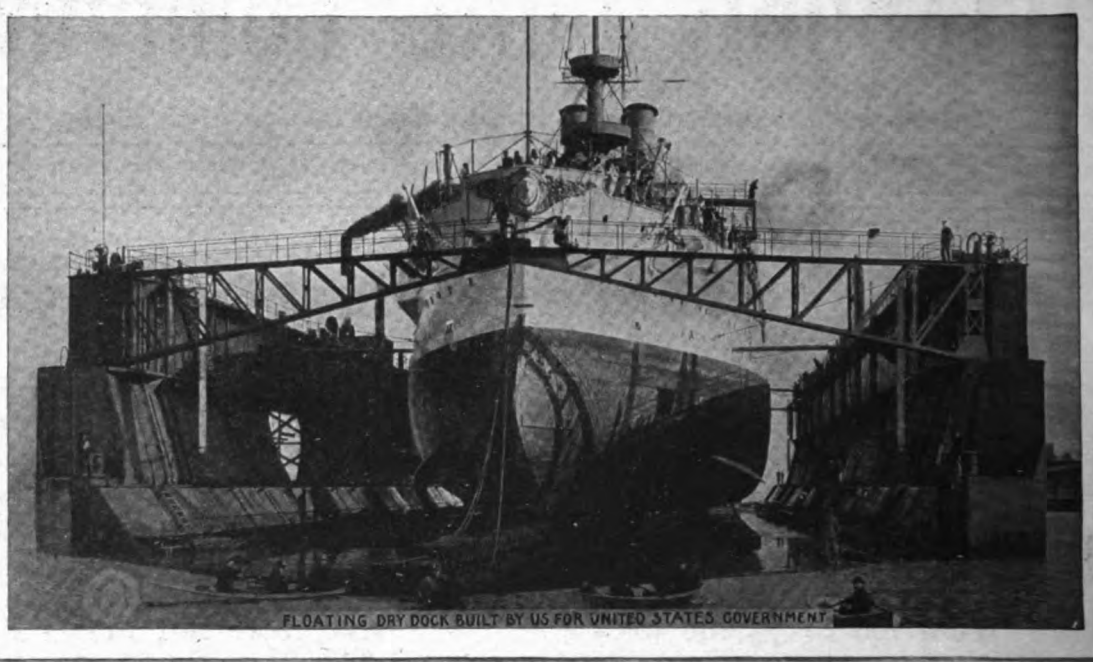

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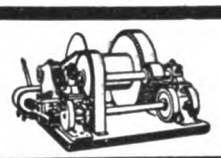

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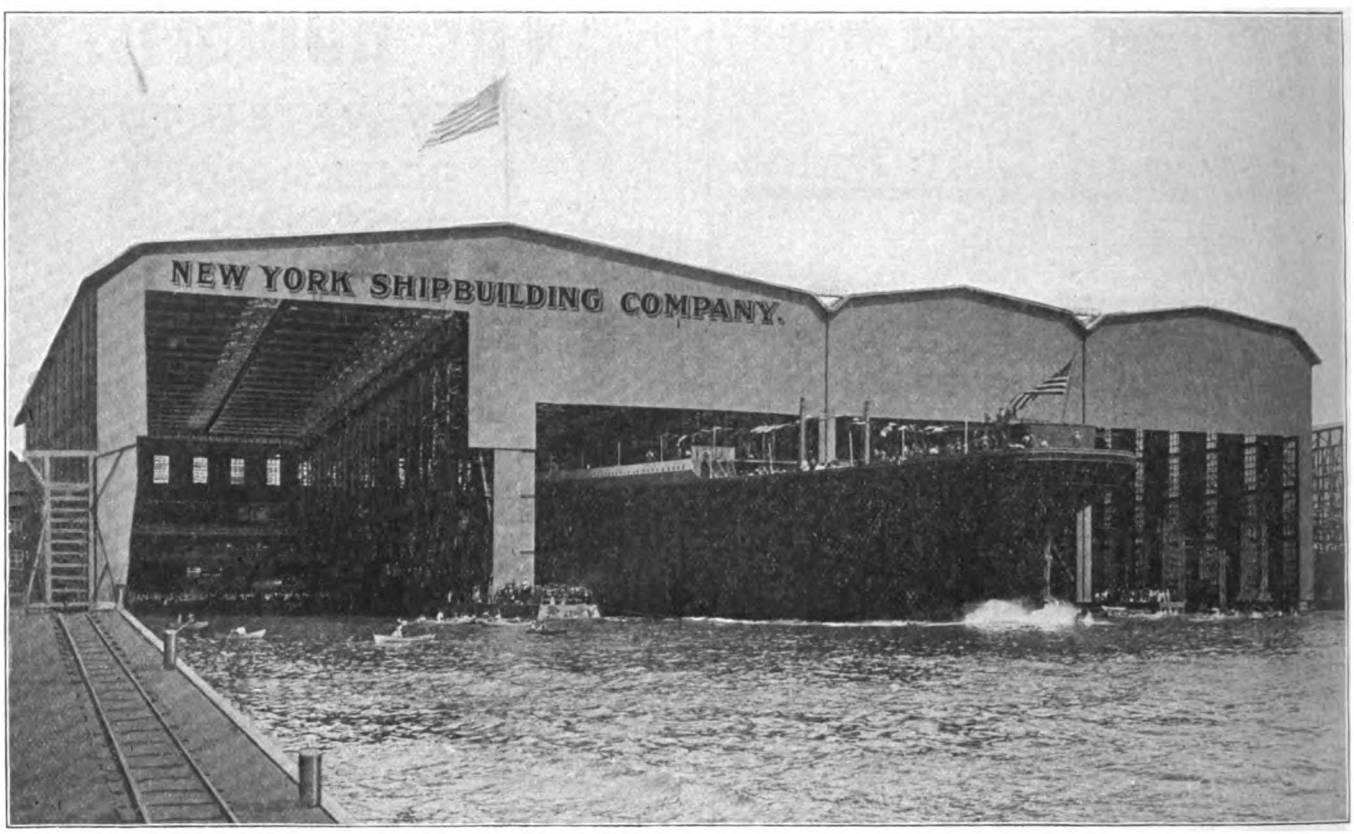

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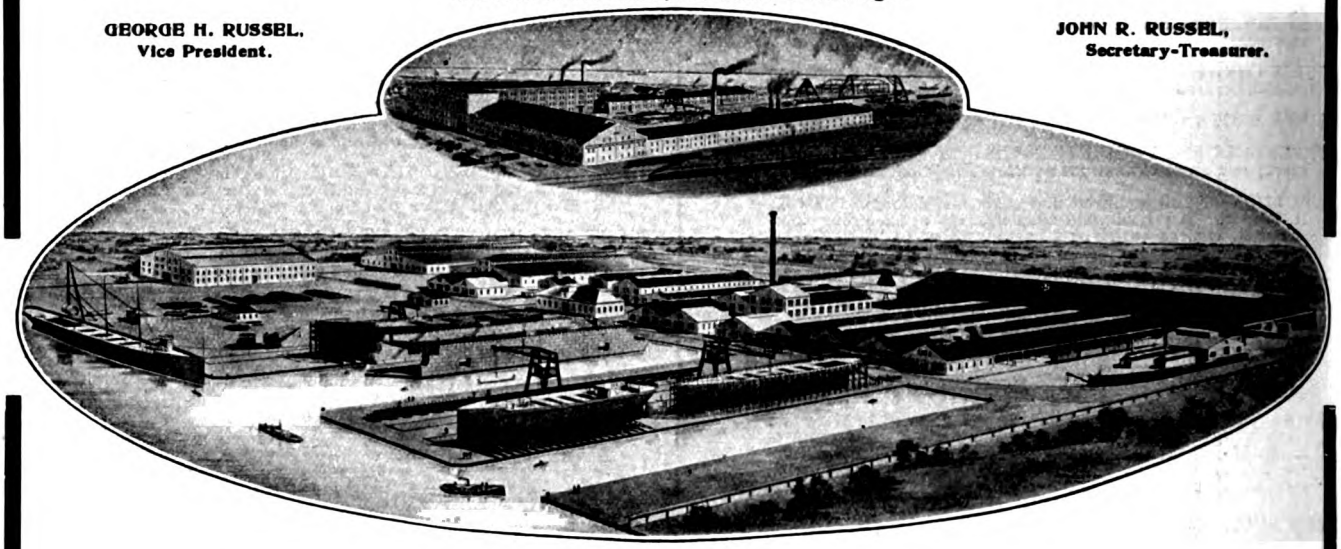

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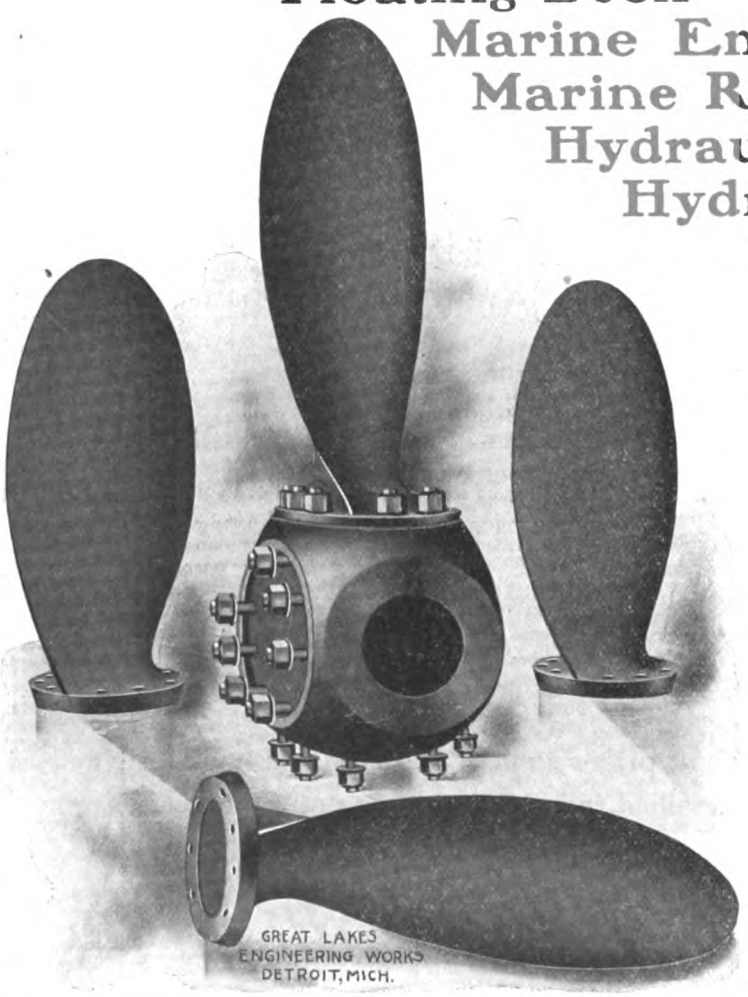

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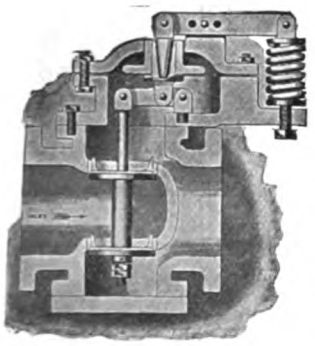

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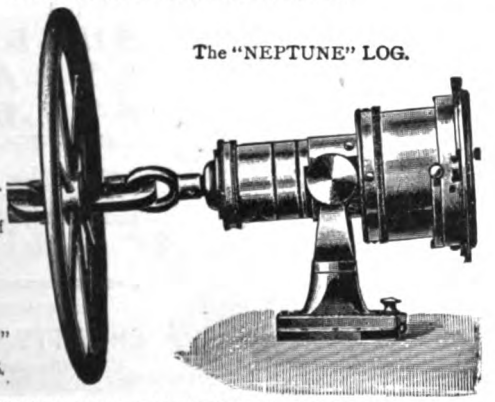

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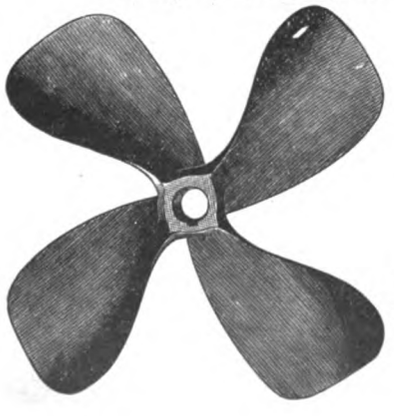

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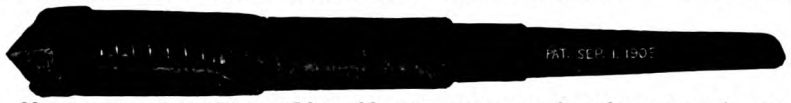

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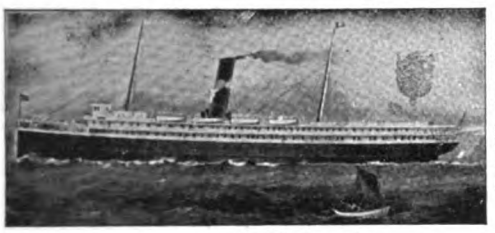

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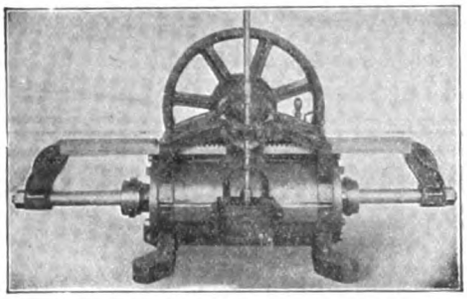

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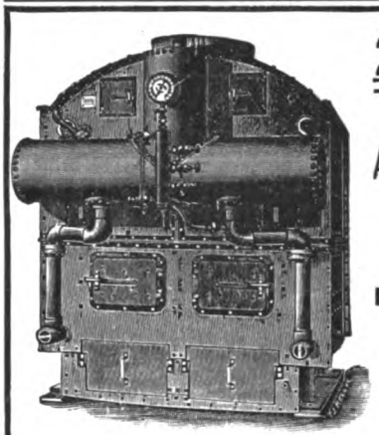

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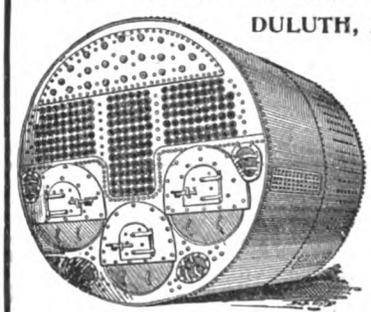

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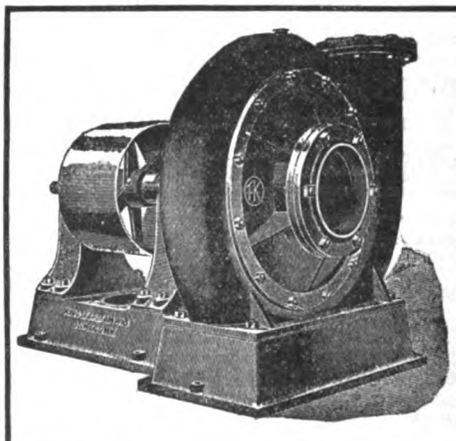

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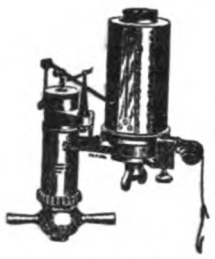

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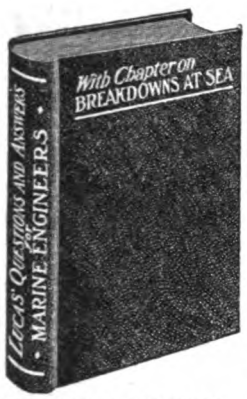

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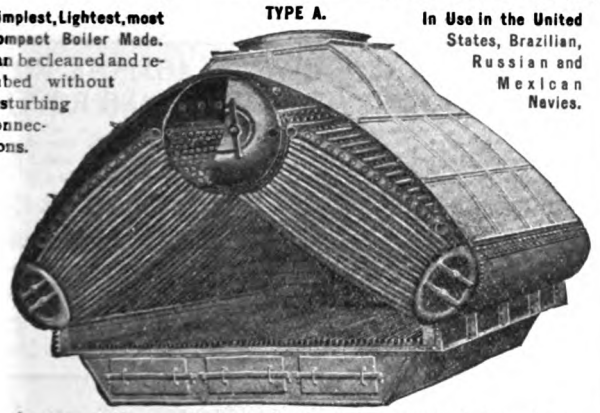

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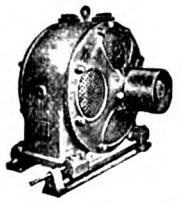

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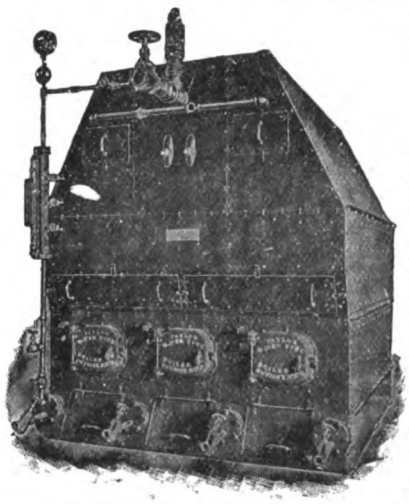

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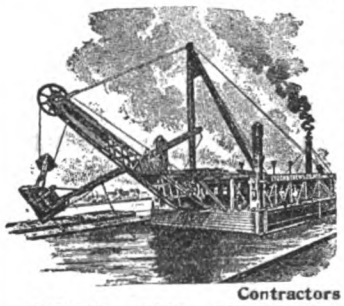

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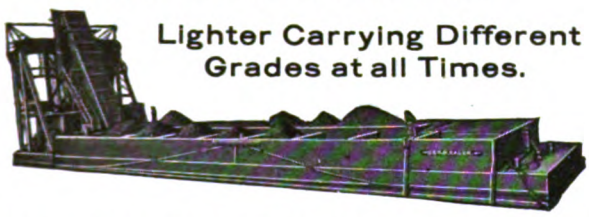

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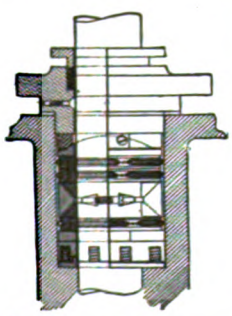

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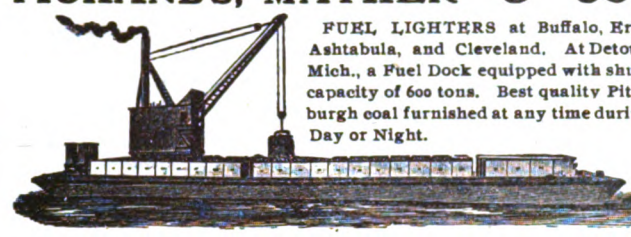

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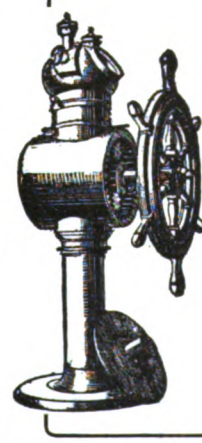

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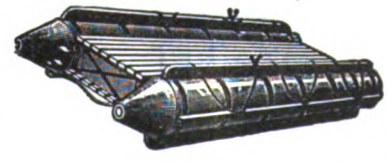

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Fore River Shipbuilding Co.....Quincy, Mass.
Macbeth Iron Co.....Cleveland.

FLUE WELDING.
Fix's, S. Sons .....Cleveland.

FUEL ECONOMIZERS.
Sturtevant Co., B. F.....Hyde Park, Mass.

FUELING COMPANIES AND COAL DEALERS.
Hanna, M. A. & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Picklands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Smith, Stanley B., & Co.....Detroit,
Smith Coal & Dock Co., Stanley B.Toledo, O.

FURNACES FOR BOILERS.
Continental Iron Works.....New York.

GASKETS, RUBBER.
New York Belting & Packing Co..New York.

GAS BUOYS.
Safety Car Heating & Lighting Co..New York.

GAS AND GASOLINE ENGINES.
Chase Machine Co.....Cleveland.
Georgian Bay Engineering Works.....
..... Midland, Ont.
Reliance Mfg. Co..... Providence, R. I.

GAUGES, STEAM AND VACUUM.
American Steam Gauge & Valve Mfg. Co.
..... Boston.
Ashton Valve Co.....Boston.
Lunkenheimer Co. .....Cincinnati.

GAUGES, WATER.
Bonner & Co., Wm. T.....Boston.
Lunkenheimer Co. .....Cincinnati, O.

GRAPHITE.
Dixon Crucible Co., Joseph..Jersey City, N. J.

HAMMERS, STEAM.
Chase Machine Co.....Cleveland.

HATCH COVERS.
American Canvas & Tarpaulin Corp ... Buffalo.

HEATING APPARATUS.
Sturtevant, B. F. Co.....Hyde Park, Mass.

HOISTS FOR CARGO, ETC.
American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co. (Inc.)....
..... Cleveland.
Chase Machine Co.....Cleveland.
General Electric Co.....New York.
Georgian Bay Engineering Works.....
..... Midland, Ont.
Hyde Windlass Co.....Bath, Me.
McMyler Mfg. Co..... Cleveland.
Marine Iron Co.....Bay City.
Mietz, Aug. .....New York.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

HOLLOW STAYBOLT IRON.
Falls Hollow Staybolt Co...Cuyahoga Falls, O.

HOSE, RUBBER.
New York Belting & Packing Co..New York.

HYDRAULIC DREDGES.
Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.
Watson-Stillman Co., The.....New York.

ICE MACHINERY.
Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

INDICATORS FOR STEAM ENGINES.
American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.

INJECTORS.
American Injector Co.....Detroit.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Lunkenheimer Co .....Cincinnati.
Penberthy Injector Co.....Detroit, Mich.

INSURANCE, MARINE.
Elphicke, C. W. & Co.....Chicago.
Fleming & Co., E. J.....Chicago.

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Gilchrist & Co., C. P.....Cleveland.
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Hutchinson & Co.....Cleveland.
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McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Peck, Chas. E. & W. F..New York & Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.

IRON CASTINGS.
Reading Iron Co.....Reading. Pa.

IRON ORE AND PIG IRON.
Bourne-Fuller Co.....Cleveland. O.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.
Reading Iron Co.....Reading, Pa

LAMPS, INCANDESCENT.
Westinghouse Elec. & Mfg. Co.....Pittsburg, Pa.
Sawyer-Man Electric Co. .....Pittsburg, Pa.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.
Georgian Bay Engineering Works.....
..... Midland, Ont.
Marine Iron Works.....Chicago.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P.....Winthrop Harbor, Ill.

LIFE PRESERVERS, LIFE BOATS, BUOYS.
Armstrong, Cork Co.....Pittsburg.
Drein, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, D. .....New York

LIGHTS, SIDE AND SIGNAL.
Russell & Watson .....Buffalo.

LOGS.
Walker & Sons, Thomas ....Birmingham, Eng.
Also Ship Chandlers.

LUBRICATING GRAPHITE.
Dixon Crucible Co., Joseph..Jersey City, N. J.

LUBRICATORS.
Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

LUMBER.
Martin-Barriss Co.....Cleveland.

MACHINISTS.
Chase Machine Co.....Cleveland.
Hickler Bros. .....Sault Ste. Marie, Mich.
Lockwood Mfg. Co.....East Boston, Mass.

MACHINE TOOLS (WOOD WORKING).
Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS.
Hickler Bros. .....Sault Ste. Marie, Mich.

MARINE RAILWAYS, BUILDERS OF.
Crandall & Son, H. I....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.
Fogg, M. W.....New York.

MECHANICAL DRAFT FOR BOILERS.
American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works ..Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

METALLIC PACKING.
Katzenstein, L. & Co.....New York.

METAL POLISH.
Bertram's Oil Polish Co.....Boston

MOTORS, GENERATORS—ELECTRIC.
Fisher Electrical Works.....Detroit.
General Electric Co.....Schenectady, N. Y.
Sturtevant, B. F. Co.....Hyde Park, Mass.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

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Ritchie, E. S., & Sons.....Brookline, Mass.

NAVAL ARCHITECTS.
Hynd, Alexander .....Cleveland.
Kidd, Joseph.....Duluth, Minn.
Kreer & Parsons. .....Chicago.
Lovejoy, H. O.....Buffalo.
Matteson & Drake.....Philadelphia.
Mosher, Chas. D.....New York.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Wood, W. J.....Chicago.

OAKUM.
Stratford, Oakum Co.....Jersey City, N. J.

OIL ENGINES.
Mietz, Aug. .....New York.

OILS AND LUBRICANTS.
Dixon Crucible Co., Joseph..Jersey City, N. J.
Standard Oil Co.....Cleveland.

PACKING.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Katzenstein, L. & Co.....New York.
New York Belting & Packing Co...New York.

PACKING TOOL.
Matteson & Drake .....Philadelphia.

PAINTS.
Baker, Howard H. & Co.....Buffalo.
Carbolineum Wood Preserving Co....Milwaukee.
New Jersey Zinc Co.....New York.
Upson-Walton Co. .....Cleveland.

PATTERN SHOP MACHINERY.
Atlantic Works, Inc.....Philadelphia.

PILE DRIVING AND SUBMARINE WORK.
Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co..
..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros. .....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co.,
.....Duluth, Minn.
Parker Bros. Co., Ltd.....Detroit.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H...Milwaukee.
Sullivan, M. .....Detroit.

PIPE, WROUGHT IRON.
Bourne-Fuller Co.....Cleveland, O.
Crane Co. .....Chicago.
Macbeth Iron Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

PLANING MILL MACHINERY.
Atlantic Works, Inc.....Philadelphia.

PLATES—SHIP, STRUCTURAL, ETC.
Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.
Reading Iron Co .....Reading Pa

PRESSURE REGULATORS.
Kieley & Mueller .....New York.
Ross Valve Co.....Troy, N. Y.

PROPELLER WHEELS.
American Ship Building Co.....Cleveland.
Atlantic Works .... East Boston, Mass.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.. Detroit.
Hyde Windlass Co.....Bath, Me.
Lockwood Mfg Co.....East Boston, Mass.
Marine Iron Works ..... Chicago.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
Roelker, H. B.....New York.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp & Sons Co., J. E.....Trenton, N. J.
Trout, H. G.....Buffalo.

PROJECTORS, ELECTRIC.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

PUMPS FOR VARIOUS PURPOSES.
Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works Detroit.
Marine Iron Works ....Chicago.
Kingsford Foundry & Machine Works....
..... Oswego, N. Y.

REFRIGERATING APPARATUS.
Great Lakes Engineering Works.....Detroit.
Roelker, H. B. .....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.
Great Lakes Register .....Cleveland.
Record of American & Foreign Shipping..
.....New York.

REPAIRS—ENGINE AND BOILER.
(See also Boiler Manufacturers and Engine Builders.)
Georgian Bay Engineering Works.....
.....Midland, Ont.

RIVETS, STEEL FOR SHIPS AND BOILERS.
Bourne-Fuller Co.....Cleveland, O.

SAFETY VALVES.
American Steam Gauge & Valve Mfg. Co.
..... Boston.
Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

SAIL MAKERS.
American Canvas & Tarpaulin Corp ....Buffalo.
Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.

SALVAGE COMPANIES.
See Wrecking Companies.

SEARCH LIGHTS.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

SHEARS.
See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.
Bourne Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

SHIP BUILDERS.
American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bertram Engine Works Co., Ltd.Toronto, Can.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co .....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Maryland Steel Co.....Sparrows Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
New York Shipbuilding Co.....Camden, N. J.
Roach's Ship Yard .....Chester, Pa.
Shipowner's Dry Dock Co.....Chicago.
Smith & Son, Abram.....Algonac, Mich.
Willard, Chas. P. & Co.Winthrop Harbor, Ill.

SHIP CHANDLERS.
American Canvas & Tarpaulin Corp ... Buffalo.
Baker, Howard H. & Co.. .....Buffalo.
Marine Mfg. & Supply Co.....New York.
Upson-Walton Co.....Cleveland.

SHIP DESIGNERS.
Kidd, Joseph.....Duluth
Kreer & Parsons. .....Chicago
Matteson & Drake.....Buffalo
Rice & Lovejoy.....Buffalo
Steel, Nacey & Hynd.....Cleveland
Wood, W. J.....Chicago.

SHIP LANTERNS AND LAMPS.
Russell & Watson .....Buffalo.

SHIP TIMBER.
Martin-Barriss Co.....Cleveland.

SMOOTH-ON COMPOUND, FOR REPAIRS.
Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.
Falls Hollow Staybolt Co..Cuyahoga Falls, O.
Reading Iron Co..... ,....Reading, Pa.

STEAM VESSELS FOR SALE.
Gilchrist & Co., C. P. .....Cleveland.
Holmes, Samuel .....New York.
Lester, S. S..... Quebec, Can.
McCarthy, T. R.....Montreal, Can.

STEAMSHIP LINES, PASS. AND FREIGHT.
American Line .....New York.
Anchor Line .....Buffalo.
Boston Steamship Co .....Boston.
International Mercantile Marine Co.....
..... Philadelphia.
New York & Cuba Mail S. S. Co..... New York
Red Star Line .....New York.
United Fruit Co .....Boston.

STEEL CASTINGS.
Otis Steel Co.....Cleveland.

STEERING APPARATUS.
American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.
Moulton Steering Engine Co.....New York.
Sheriffs Mfg. Co.....Milwaukee.

SUBMARINE DIVING APPARATUS.
Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.
Gaskin, Edward .....Buffalo.
Hynd, Alexander .....Cleveland.
Lovejoy, H. O.....Buffalo.
Matteson & Drake .....Philadelphia.
Parker Bros. Co., Ltd.....Detroit.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

TARPAULINS.
American Canvas & Tarpaulin Corp ....Buffalo.

TESTS OF MATERIALS.
Hunt, Robert W. & Co.....Chicago.
Lunkenheimer Co .....Cincinnati, O

TILING, INTERLOCKING RUBBER.
New York Belting & Packing Co...New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.
Watson-Stillman Co.....New York.

TOOLS, WOOD WORKING.
Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.
American Ship Windlass Co..Providence, R. I.
Chase Machine Co.....Cleveland.

TOWING COMPANIES.
Donnelly Salvage & Wrecking Co.....
.....Kingston, Ont.

TRAPS, STEAM.
Kieley & Mueller .....New York.
Sturtevant Co., B. F., ...Hyde Park, Mass.

TRUCKS.
Boston & Lockport Block Co.....Boston.

TUBING, SEAMLESS.
Shelby Steel Tube Co.....Pittsburg, Pa.

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Ashton Valve Co. ..... Boston.
Crane Co. ..... Chicago.
Jenkins Bros. ..... New York.
Kieley & Mueller ..... New York.
Lunkenheimer Co. ..... Cincinnati.
Ross Valve Co. ..... Troy, N. Y.

VALVES FOR WATER AND GAS.

Lunkenheimer Co. ..... Cincinnati.
Ross Valve Co. ..... Troy, N. Y.

VARNISHES.

Detroit Varnish Co. ..... Detroit.
Detroit White Lead Works ..... Detroit.
New Jersey Zinc Co. ..... New York.
Also Ship Chandlers.

VENTILATING APPARATUS FOR SHIPS.

Sturtevant, B. F. Co. ..... Hyde Park, Mass.

VESSEL AND FREIGHT AGENTS.

Boland, John J. ..... Buffalo.
Brown & Co. ..... Buffalo.
Elphicke, C. W. & Co. ..... Chicago.
Fleming & Co., E. J. ..... Chicago.
Gilchrist & Co., C. P. ..... Cleveland.
Hall, John B ..... Buffalo.
Helm & Co., D. T. ..... Duluth.

VESSEL AND FREIGHT AGENTS—Con.

Hawgood & Co., W. A. ..... Cleveland.
Holmes, Samuel ..... New York.
Hutchinson & Co. ..... Cleveland.
Lester, S. S. ..... Quebec, Can.
McCarthy, T. R. ..... Montreal.
Mitchell & Co. ..... Cleveland.
Parker Bros. Co., Ltd. ..... Detroit.
Prindiville & Co. ..... Chicago.
Richardson, W. C. ..... Cleveland.
Sullivan, D. & Co. ..... Chicago.

WATER GAUGES.

Bonner & Co., Wm. T. ..... Boston
Lunkenheimer Co. ..... Cincinnati, O.

WATERTIGHT BULKHEAD DOORS.

"Long Arm" System Co ..... Cleveland.

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co. ..... Buffalo.
DeGrauw, Aymar & Co. ..... New York.
Upson-Walton Co. ..... Cleveland.

WHISTLES, STEAM.

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co. ..... Boston.
Lunkenheimer Co. ..... Cincinnati.

WINDLASSES.

American Ship Windlass Co. . Providence, R. I.
American Ship Building Co. ..... Cleveland.
Hyde Windlass Co. ..... Bath, Me.
Marine Mfg. & Supply Co. ..... New York.

WINCHES.

American Ship Windlass Co. . Providence, R. I.
Georgian Bay Engineering Works. ..... Midland, Ont.
Hyde Windlass Co. ..... Bath, Me.

WOOD PRESERVING PAINT.

Carbolineum Wood Preserving Co. ... Milwaukee.

WOOD WORKING MACHINERY.

Atlantic Works, Inc. ..... Philadelphia.

WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co. ..... Kingston, Ont.
Parker Bros. Co., Ltd. ..... Detroit.

YACHT AND BOAT BUILDERS.

Bertram Engine Works Co., Ltd. . Toronto, Can.
Drein, Thos. & Son ..... Wilmington, Del.
Georgian Bay Engineering Works. ..... Midland, Ont.
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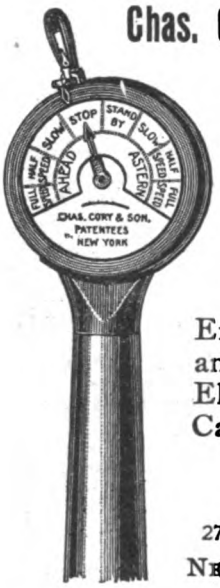

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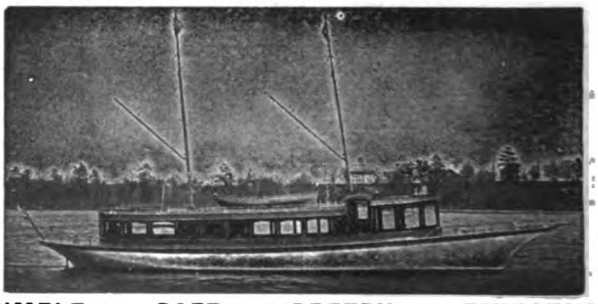

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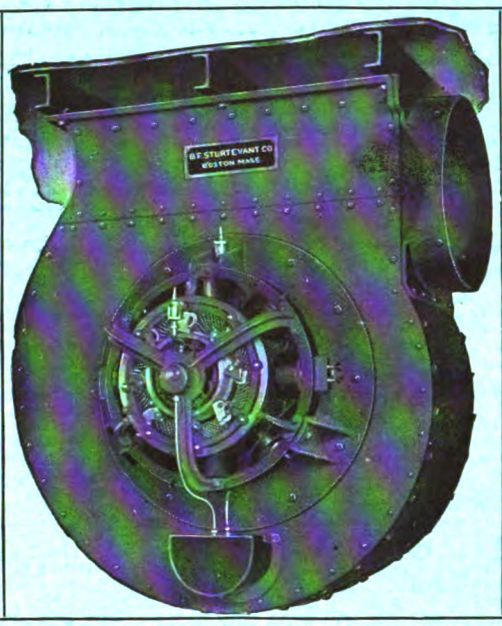

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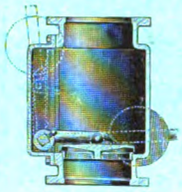

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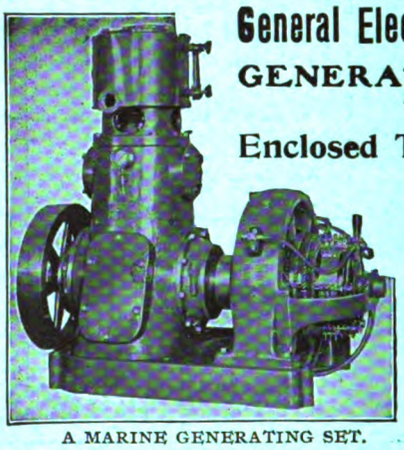

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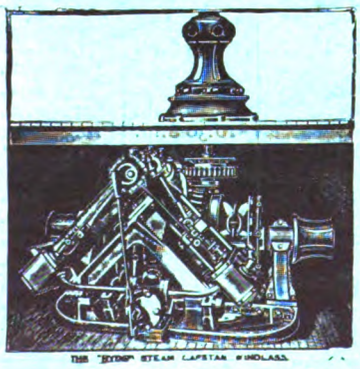

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